GUIDANCE IN EDUCATION

SRINIBAS BHATTACHARYA

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GUIDANCE IN EDUCATION

By the Same Author

Our Society and Education
Tagore and the World

Guidance in Education

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TO

the deeply loved and revered friend,
philosopher and guide to mankind
DR. S. RADHAKRISHNAN
whose life is an example to his countrymen

Preface

The present Volume is an attempt to study the different aspects of guidance with special reference to the present situation in Indian education. With the introduction of multipurpose schools all over India the question of allocation has assumed much importance. Everyone interested in education is confronted with a new set of problems in the field.

The author has made an attempt to cover the field in three parts: (*i*) Philosophical Basis of Guidance or Introduction (*ii*) Scientific Basis of Guidance and (*iii*) Practical Aspects of Guidance.

The First Part deals with the introduction, meaning and concept of guidance and the basic principles of guidance. The Second Part which is technical in nature mainly aims at finding out an objective basis of educational guidance and as such is based on research for a long time. Attempt has been made to evolve a number of tests and techniques and validate them for use in our schools for the purpose of allocation. The experimental procedure, the details of the test construction together with bearing of these on guidance have been described in Part II.

The Third Part deals with the various issues concerned with the problem and serves as a handbook for all the workers in the field of operation.

The appendix of the book though heavy is an indispensable feature of such research publications and contains useful directions and test materials.

It is hoped that this account will be of some use to all interested in this vital issue and all our efforts will have made a contribution towards the realisation of our aims of education.

S. B.

Foreword

I had the pleasure and privilege of going through 'Guidance in Education' by Professor Srinibas Bhattacharya. His work has impressed me because of its bold approach and originality of outlook. His work is unique in the field and provides a scope for further investigation in the line. It is a scholarly as well as a practical treatise designed to serve the purpose of a guide to every counsellor and teacher interested in child guidance.

I am sure that Professor Bhattacharya has shown a new line and practical outlook in the field of allocation in any underdeveloped country. His pioneer work is a definite contribution and is bound to be welcome by psychologists, teachers and educationists alike.

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The author will fail in his duty if he does not take the opportunity of acknowledging his debt of gratitude to Professor S. C. Mitra, Formerly Head of the Dept. of Psychology, Calcutta University, Mr. H. E. O. James and Mrs. D. M. Edwards Penfold of the London University and Dr. J. C. Das Gupta, Principal, David Hare Training College, Calcutta for their inspiration and guidance.

S. B.

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Part I

PHILOSOPHIC BASIS OF GUIDANCE

CHAPTER THREE

The Various Aspects of Guidance

GUIDANCE involves both individual and group guidance, educational and vocational guidance. Besides, there is the problem of clinical guidance.

Appraising personal adjustment is one of the functions of guidance. There should be sociometric appraisal of students as well. The personality measures alone are not complete. They should be supplemented by sociometric devices.

Because group life is such an important aspect of everday living, it is essential that students acquire some skill in situations involving social interaction. There are many students who are unhappy with their place in the group and they can achieve more satisfying group-adjustment with the help of the counsellor. The class room should be regarded as a social situation as individual members of the class affect each other. Their harmonious relations with others, and a feeling of security and satisfaction help better adjustment both as learners as well as persons. Sociometric devices can assist teachers in indentifying the existing psychological affinities. In one of their classical studies Hartshorne and May developed and used a technique similar to sociometric test. This is known as the "Guess Who" technique. Like sociogram the "Guess Who" device can provide significant clues for further study of individuals.

In a school the most outstanding problem is retardation among the children, and guidance has to take into account the intensity of the problem. The question of backwardness presents a problem to the guidance experts, and they should try to tackle the problem. In order to make guidance really effective it should start at an earlier stage.

Counselling at the Elementary School Level. Counselling may be done by the regular classroom teacher or any expert. This is a technical job and so a counsellor should make an intensive study of the children's problem. He must gather information about the pupils in co-operation with teachers, guardians, psychologists, etc. He should also remember that children are restless and their interests may be changing. It is, therefore, essential to draw their love and affection and come in closer contact with them for understanding them and their problems.

Counselling at the Secondary Schools. In a secondary school, counselling should be more thorough because of the need for vocational guidance at that stage. Regular classroom teachers should impress the importance of guidance upon their pupils. At this stage students will have to get themselves prepared for a complete living. They will have to know themselves and the outside world for a successful adjustment. Many adolescents face a number of problems at the secondary school level and some of them are very complicated. They require constant guidance and sympathetic treatment. The counsellor should, therefore, be alert to these situations. There are some typical problems in the field of secondary education such as delinquency, mental retardation and personality disorders. A real guidance should take up these problems as well. The function of the counsellor at this stage changes. He should no longer confine his activities within the four walls of the school, but extend himself outside school in the community and greater society.

Counselling the New Students on Entrance into the School. When a student enters a school on transfer from a different institution the counsellor has very little information about the student. The important thing at the outset is to explore the possibilities of getting as much information as possible in a short period. Satisfactory adjustment is sometimes absent in many cases and the counsellor has to help a lot in the matter of adjustment. This is not always easy to do as the counsellor has to discover the interests, hobbies, skills and abilities and aptitudes before giving final direction.

Counselling Entrance into Vocation. In a country like ours many students are compelled to withdraw from schools because of poverty. A student after studying for some time has got to know his own mind and abilities on the one hand and occupational opportunities on the other. The practice of providing vocational training during the schooling period depends upon the time at the disposal of the student. The task of the counsellor at this stage will be mainly to act as a co-ordinating officer with information of the employment opportunities and the needs of the country. He should also have an idea of the technique of job analysis and the demands of the time and the society.

Group Guidance and the Technique. There are various ways of group guidance and some has suggested that group guidance in common learnings and classes is very effective. This may be through extra classes, school clubs and hobby centres. Traditionally, the main purpose is to serve the community. From the standpoint of group guidance discussion at home on topics having guidance value is an excellent proposition. This should be made effective through orientation or initiation programmes directed towards the development of the students' interests. As mentioned before, group guidance is essential because of its utility in various respects.

Helping through Vocational Guidance. Vocational guidance should not be regarded as a separate entity. It may be defined as that process which

As there should be various other streams or courses besides the humanities in a multilateral school, transfer within the same institution becomes easier to arrange. Though the need for a network or such schools throughout the country is a long-felt one, there would still be room for unilateral schools where more intensive instruction or a particular form of training may be expected.

In any case the different occupational needs of the community will have to be taken into consideration, and the curriculum in these educational institutions should be reorganized accordingly.

India is a country where agriculture is the primary occupation of the people, and the national economy is influenced by this to such an extent that its importance can hardly be denied. In the rural schools of our country agricultural education should therefore form the main subject.

An important medium of child development is undoubtedly technical education, leading to a healthy co-ordination of head, hand and heart. Thus, technical education has a large part to play in the curriculum of our schools in future. Its relation to industry and the industrial world, and its bearing on the development of personality cannot be overemphasized. As far back as 1882, the Hunter Commission realized the indispensable need for technical education and stressed the provision of diversified courses of study in the schools.

Because of the wide range it covers, various stages at which technical education may be imparted have been suggested in the Report of the Mudaliar Commission. Thus the Commission envisages technical education for :

1. Students of higher secondary schools in the four upper classes.
2. Students who, being unable to pursue the full course leave school for economic reasons and find it necessary to earn a living as early as possible.
3. Those who have successfully completed secondary school course and desire to pursue technical education in polytechnic or occupational institutes without going to a University.
4. Those belonging to any of the above categories who after completion of their course are gainfully employed, but who wish to improve their prospects by part time evening courses in subjects of their own choice.

Besides, there are other courses also, viz., commerce, fine arts, science, and humanities. The curriculum, therefore, will consist of a number of elective groups, in addition to the common core subjects like languages, social studies and crafts such as spinning, woodwork, tailoring and modelling. In a multilateral school there must be clearly defined alternative courses suitable for particular occupation which can be pursued separately in the same school building. Such a school depends for its success on the mutual influence of the different categories of students who will freely participate in all kinds of extra-curricular activities.

The Ministry of Education has decided that about five hundred selected high schools throughout India should be converted into multipurpose schools during the remainder of the Second Plan period. Taking two as the average number of new courses to be provided in each school, the total number of new units of diversified courses that will have to be provided under the scheme would be approximately a thousand. It has been decided that this total provision of a thousand courses may be distributed broadly as follows :

1. 200 Science courses
2. 200 Technical courses
3. 300 Agricultural courses
4. 150 Commerce courses
5. 50 Fine Arts courses
6. 100 Home Science courses

There will be boys of high intelligence as well as of low intelligence ; everyone of them should be made to feel that he is of equal importance. Each has to be given an opportunity of developing his particular talent, artistic or academic. We would have to cater for the whole man, and develop his personality in its fourfold aspects—physical, social and moral, aesthetic and intellectual. The process of differentiation for the appropriate type of secondary education should begin in the later years of the primary stage, and this should be based on effective school records, which should give a complete picture of the child's development. After taking into consideration the wishes of the students' guardian and the pupil himself, a recommendation should be made about the type of school where the pupil should continue his education. At the end of two years the pupil's progress should be sympathetically and carefully reviewed, and roughly at the age of fourteen promotion to higher forms should be carried out on the basis of the result of the tests.

In actual life, we find that pupils even after receiving "education", cannot adjust themselves to the real ethics of life. As a result considerable unrest exists in the minds of the pupils and they are not happy with the life in which they are placed afterwards. Moreover, the problem of unemployment has been increasing day by day even among educated persons. There is, on the other hand, a great dearth of trained people who are needed for the implementation of the Plans initiated by the Government.

The educationists in our country have been thinking about this for a long time. In order to improve the present conditions of the young students and make them fit for their future life, the Union Ministry of Education—with the object of providing proper education to the students according to their aptitude, intelligence, ability and interest—has accepted the scheme of introducing multipurpose schools with diversified courses in all the States.

The All-India Council for Secondary Education has been set up by the Union Ministry of Education in order to advise the Central Government on all matters relevant to the implementation of the recommendations of the Secondary Education Commission.

A Central Education Bureau has also been established to take up the work of guidance in the Indian Union. It is the duty of the Bureau to keep an eye on the activities of the State Bureaux under the Union. It is expected that each State will have a Bureau to tackle the problem of educational guidance.

Teachers will be trained by the State Bureau for such multipurpose schools, so that they can give educational and vocational guidance objectively to their pupils, after careful observation and administration of different kinds of tests.

Because of the rapid increase in the number of the educated unemployed, the need for guidance is being felt more and more, and a few universities have established guidance bureaux.

The movement of mental measurement was thus started so that the mental calibre of each student could be correctly gauged and his vocation appropriately determined. In particular, the more enlightened parents became eager to have an accurate idea of their children's mental efficiency with the hope that they might excel in the vocation chosen. The Department of Psychology, Calcutta University, opened a vocational guidance service on a small scale. Certain non-official bodies, such as the Parsee Panchayet in Bombay and the Y.M.C.A., began to work in the field of vocational guidance by publishing literature with information about different types of courses and careers. It was, however, the Secondary Education Commission which focused our attention on guidance work at the pre-school level. It strongly advocated the introduction of school guidance services along with vocational guidance. To develop the idea further, an All-India Seminar on Educational and Vocational Guidance was held at the Central Institute of Education, Delhi, on the initiative of the Institute. The second seminar on the same problem was held at the same place while the third seminar was convened by the Faculty of Psychology and Education of the University of Baroda. The third seminar met at Baroda and decided to form the All-India Association of Educational and Vocational Guidance.

In the meantime, some of the State Education Departments have taken steps for the introduction of guidance work in school. A Bureau of Psychological Research was established in Allahabad by the Government of U.P. with the objective of developing psychological tests, training of guidance personnel, etc. A Vocational Guidance Department was also started at the same place in 1950. A Bureau of Educational and Psychological Research was established by the Government of West Bengal in 1953 at the David Hare Training College in Calcutta. The Bureau offers courses in educational and vocational guidance, training of guidance personnel, etc.

In pursuance of the recommendations of the Secondary Education Commission, the Government of India accepted the principle of setting up guidance services in secondary schools. In 1954, it established the Central Bureau of Educational and Vocational Guidance. It also adopted the policy of giving financial assistance to States desirous of setting up similar bureaux. As a result, several States established bureaux for educational and vocational guidance. Thus when the All-India Association of Educational and Vocational Guidance was established at Baroda, there were persons present who were already devoted to the cause of the movement.

The establishment of multilateral schools gave an additional impetus to the school-guidance movement. This created the immediate problem of offering guidance to pupils for the different "streams" on a scientific basis, in order to avoid waste as far as possible. In fact, scientific guidance is being considered essential in realizing the idea that education should be according to the interests and abilities of the pupils. To consider the special problems of guidance in multilateral schools, the Ministry of Education of the Government of India held a seminar in 1956 with the State representatives consisting of headmasters of multilateral schools and the State Bureau of Education.

It seems, therefore, that State patronage has already been secured for the school-guidance movement in this country. But in order to offer effective school guidance a scientific basis should be found out after a survey of human abilities has been taken.

CHAPTER TWO

The Concepts of Guidance

ANY PLANNED educational activity may be termed guidance. The purpose of guidance is to help one to adjust one's abilities and interests to the needs of the society. In other words, it means helping a person to develop in the desired direction and to orient himself according to the needs and demands of changing times and society. Guidance, therefore, seeks to make each individual fitted to his interests, his abilities, and his plans for life in the vocational world. Thus it encourages the individual to discover his talents in relation to the opportunities in life.

It is our responsibility to see that the educative process keeps pace with the "ever-changing but insistent present". The young person of today needs to acquire a wide range of skill and to reach a high standard. The skills include not only skill in reading as well as writing, in speaking, as well as listening, but also skill in various arts and crafts, skill in thinking, judging, appreciating and understanding, and above all, the skill of self-discipline and self-guidance and the skill in making the unending choices of life and in evaluating our experiences.

Guidance is one of the means employed by educationists to impart skill. The child learns from his teacher not only mastery over a particular subject, but also develops proper attitude and habits.

The basic concepts of guidance which are derived from various branches of study must be applied "steadily, consistently and quietly in all classrooms and in all activities. This can be done only through a guidance programme."

The basic principles of such a programme may be outlined as follows :

(*a*) Guidance to be effective must be continuous. Since problems do not occur at any particular age and since choices are ever-present the school guidance programme must offer services for all ages and at every stage.

(*b*) The teacher as the guide and counsellor should provide leadership in the guidance programme.

(c) Guidance should be available to everyone and not just reserved for the "problem" child.

There are different forms of guidance programme. They are :

1. Educational Guidance
2. Vocational Guidance
3. Social Guidance
4. Economic Guidance
5. Leadership Guidance
6. Leisure-time Guidance, etc.

The purpose of this book is not to deal with every type of guidance but to limit its scope within a specified area. This is also known as curricular guidance as this refers to one's preference of one curriculum to another where there are different courses open to the student. This type of guidance is purposive as it has a bearing on the dynamic concept of education. This is why guidance and education are closely related. In short, education involves guidance. Broadly speaking, all guidance is education, but some aspects of education are not guidance. The objectives of both may be the same, viz., the development of the individual, but the methods used are different.

Presently, educational guidance has attracted the attention of many in India because of the rapid changes in the field of secondary education. Informal guidance was undoubtedly there previously but any scientific method or systematic approach was not adopted for this purpose.

Educational guidance has a wider implication as it aims at assisting individual pupils in their intellectual, emotional and physical developments. The focus of guidance is, therefore, to promote the growth of the individual by self-direction. It is vitally related to every aspect of the school, the curriculum, the method of instruction and home and community relations.

The work of educational guidance is not peculiar to the secondary schools but it should start from the earliest grade onwards for the collection of data about individual pupil. An outline of a guidance programme may be as follows :

1. To help the individual in understanding himself through his intellectual ability and different relationship, social and economic, in society at large.
2. To help the pupils to consider the possibilities of better and successful educational adjustment.
3. To assist boys in the right choice of their course of study in which the greatest possible service may be rendered and maximum satisfaction derived.

4. To help students to realize the responsibility of learning and to adopt methods of teaching according to the needs of the individual.
5. To provide opportunities for the active participation of each student in different activities for the greater scope of observation.

In the past, vocational guidance was considered to be the only guidance which needs assistance from experts. But gradually the importance of other types of guidance has been admitted, because of the recognition of the fact that they are all inter-related. It should, therefore, be clear that no vocational guidance is complete without reference to the educational programme. Thus the question of vocational education comes as a corollary, as it involves a plan of preparation before the real preparation for the choice of a particular vocation starts. Broadly speaking, vocational guidance is the process of helping an individual to choose an occupation and for the successful preparation and progress in it. In other words, it can be defined as a process involving organized assistance to individuals for the building up of a successful career without much wastage of energy and time. The basic concept of vocational guidance is based on the recognition of marked individual differences in physical characteristics, general intelligence, special aptitude, interests and personality traits. The problem is, therefore, to select one of the many occupations suited to a particular individual after considering his abilities and limitations. It should be borne in mind that vocational guidance is a continuous process and not a single act of selection. It involves a series of activities including the follow-up study in particular cases. The responsibility of a counsellor does not, therefore, cease with the selection of an occupation but it continues until adjustment of the individual is complete. It is, therefore, reasonable to think that educational and vocational guidance cannot be set apart. Educational guidance becomes more fruitful by keeping an eye on the field of occupations and in the vocational implications. Similarly, a plan of vocational guidance must be followed or accompanied by educational guidance.

There are various phases of vocational guidance including : (1) guidance in selecting an occupation, (2) guidance in preparation for an occupation, (3) guidance in finding a job, (4) guidance in adjusting oneself to the job and (5) guidance in making progress in it.

The question of preparation for a particular occupation pertains more to education and educational guidance. But one should not forget that education is also concerned with the entire individual in his long process of adjustment to life.

As regards other types of guidance, every one is related to educational guidance which may be called the beginning of all guidance. Many other forms of guidance deserve special mention because of their importance in the present social context. On analysis, however, it appears that all guidance relates to the abilities, interests, background and needs of the individual to his life-adjustment. In reality, guidance is not always a methodology, but is sometimes the process of helping the individual to find his way into an environment most congenial to his development. This process no doubt, involves a systematic procedure demanding knowledge of the techniques of guidance.

helps the individual student appraise his potentialities and choose an occupation.

The Importance of Vocational Guidance. The structure of society today is increasingly becoming complex. Vocational guidance is concerned with the maximum utilization of human reasources. Not only a society derives benefit from correct placement of the individuals, but it also helps the individual to get maximum satisfaction. Aim of any vocation programme should be to prepare boys and girls for successful adjustment to the world of work

CHAPTER FOUR

Predicting Individual Differences

SURVEY OF HUMAN ABILITIES

INDIVIDUAL qualities, innate and acquired, influence the personality and temperament of a person. Since the time of Galton, who first studied the innate psychological qualities of different people, there have been studies about the pattern of mind, temperament and emotions. The structural theories of particular interest to the educational psychologist are faculty psychology, theories of mental structure, McDougall's instinct, psychology and the theory of temperamental traits and types. These systems are concerned with innate and acquired patterns of mental abilities, emotional traits and instincts. According to faculty psychology, the oldest structural theory, the mind consists of a number of faculties or powers that are relatively independent of one another. The major faculties of knowing, feeling and willing have played a prominent role in the theories of the nature of the soul. Other faculties, e.g., judgement, memory and imagination were also recognized, and the number of these separate faculties grew larger as time went on. At the end of the eighteenth century, the Scottish philosopher Reid, gave a list of thirty powers of the mind which later on increased to thirty-seven. The main feature of faculty psychology is based on the principle of classification of mental and spiritual life by means of the function of the soul. The faculties constitute aspects of human experience.

Mental Structure. The theory of mental structure has quite a different background from the faculties which are defined largely as the result of introspection and speculation. Mental reactions, on the other hand, are studied by experimental methods. This does not mean that the hypothesis behind the faculties have not influenced the work of Galton, Spearman, Thomson, Burt and Thurstone. It is quite clear that no factorial theory has emerged solely from the empirical test score and correlation data. Different mental tests are applied to numerous children or adults and the test scores are then subjected to mathematical and statistical analysis in order to arrive at the underlying factors of mental ability. The empirical study of the structural mind can be traced back to Galton. The statistical analysis shows that : (1) there is something common to all subjects and (2) qualities are called mental factors, and it is the business of the factor analyst to isolate and identify these factors

Spearman's Two-Factor Theory. The empirical aspect of Spearman's theory of intelligence is so frequently stressed that its background of contemporary psychological theory is apt to be overlooked. Spearman compared the performance of two small groups of children at Oxford in various tests with their achievements. He found a positive co-relation between all the materials and showed that the quality of intelligence common to any pair of tests and examinations was the same as that common to any other pair, and that the similarity between the tests and examinations could be explained by a single *general factor* of intelligence which he called "G". There were indeed specialized abilities suggested by Galton but each was so specific as to be particular to a single test. A child's score on any test could be accounted for completely by a certain amount of general ability together with the specific ability required for the particular test. "G" is the common factor of general ability and it was later shown by Spearman that his two-factor theory could hold good in spite of other theories.

Thomson's Sampling Theory. In this theory Thomson assumes that the mind is made up of many independent powers. If two test samples have same bond then a general or common factor can be said to exist between them, but if the samples have different bonds, the tests have not only explained the theory of hierarchy but it also underlies the relativity of any general factor and any set of specific factors. A test which is specific in one battery may be general in another and so on. A more serious criticism appeared when it was found that a pure hierarchy could be rarely achieved. This means that the simple picture of general and specific character is not adequate. That is why Spearman and his followers admitted the presence of group factors, such as verbal ability, numerical ability, etc. They call for special aptitudes in the sense that an aptitude can be found for a class of closely allied occupations, but Spearman's specific factors are each peculiar to one test. Hence, no test can be used to predict any intellectual quality or aptitudes other than "G". The British psychologists in general have reverted to the point of view that the general factor of intelligence may be combined with a more specific factor.

Burt's Hierarchical Structure. Burt holds the view that factors are descriptive categories and there is a room for all types of mental abilities, general, group and specific. This is known as hierarchical structure.

Following Spencer, Stout and McDougall, he assumes the existence of an organization of mind based on the specific sensor-motor activities. In Burt's own words, "the processes of the lowest level are assumed to consist of sensation". The next level includes the more complex processes of perception and co-ordinated movement as in experiments on the apprehension of form or pattern of compound reaction. The third is the associative level, the level of memory and of habit formation. The fourth and highest level involves the apprehension or application of relations. Intelligence, as the integrative capacity of the mind, is manifested in every level. But this manifestation differs not only in degree but also in their qualitative nature. Under the different headings, different factors are included, e.g., under the heading of "relation finding", we include the thought processes, generalization, abstraction, logic and combination of relations. At the associative level we include innate memory span, productive imagination, visual and audible imagery, verbal, arithmetical ability, vocabulary and practical ability.

In America, however, a further alternative theory of mental structure has been developed by Thurstone. He could find no evidence of a general factor underlying all mental activities, but was able to isolate several primary group-factors which might overlap each other in given tests in various degrees. These are "V" (Verbal comprehension), "W" (Word fluency), "N" (Number), "S" (Space), "M" (Associative memory), "P" (Perceptual speed) and "R" (Reasoning).

Summary. We have then three important theories of mental structure, Spearman's two-factor theory, the British theories which assume general, group and specific factors, and the theory of Thurstone in which a number of primary abilities are assumed. In conclusion, it may be said that the two-factor theory is not really adequate to explain data obtained from numerous empirical studies on the nature of intellectual abilities. Either the British theory of hierarchy of intellectual abilities including general, group of specific factors, or the American theory of primary abilities appears to be adequate to explain the data.

The Mental Structure and its Bearing on Educational Guidance

As mentioned before, our mind has different abilities and tendencies, and there are individual differences which can only be taken into account by a number of methods, viz., testing, observation, interviews and collection of records. As we turn to the individual qualities we are guided by different considerations. Firstly, the empirical study of the structure of mind tells us that there is something common to all subjects. These qualities are called mental factors. If we believe in the dominance of intelligence in the whole personality, then the guidance programme will be one-sided. Intelligence is one of the common factors contributing to success in life. If the notion of two factors (G and S) is entertained, then the guidance tools should also be varied. Along with the assessment of the "G" factor of intelligence there should also be attempts to analyse the different specific abilities. If, however, the multiple factor is taken for granted, then the technique for guidance should become more complicated. In short, the concept of guidance, though influenced by the different concepts of the mental structure, should not be limited and narrow, but should be comprehensive.

The Changing Concept of Intelligence. From the different notions about it the concept of intelligence still appears to be an abstraction too difficult to be isolated or assessed. But can this deny the existence of a general mental ability? The growing scepticism on the general ability is perhaps due to the fact that there is no instrument for a foolproof intelligence test Are we sure of the constituent parts of intelligence and if so, why is it so difficult to measure these aspects of it? This calls for the attention of the psychologists. It also appears that intelligence is like a fluid which may manifest itself in infinitely varied forms. If the psychologists admit their failure to survey the area of abstract intelligence, does the theory of specific factors explain everything? Here also, we are not satisfied as we feel the existence of abstract intelligence.

As regards the development of intelligence one wonders as to how our mind gradually unfolds itself in constant interaction with environment. That is why the orthodox view of constancy of I.Q. has been challenged. But if intelligence is regarded as something native and autonomous, no amount of optimism on the part of the sociologists is expected to raise that fluid to a higher level in the psychometry. If there be any change or swelling, this is certainly not that of the inherent abstract potentiality.

Different tests have been attempted to measure native intelligence, but the results of the tests differ because of their inability to cover all possible aspect and isolate each from the influence of extraneous factors, e.g., the level of motivation at the time of administration of the tests.

It is thus quite natural that any test programme is subject to criticism as psychology is not an infallible science.

Still, if one is to maintain a balanced view, the importance of general intelligence as one of the determinants of success for guidance purposes, will have to be recognized.

Scientific Basis of Guidance. Analysing an individual is more than regarding that person as the sum of separate quantitive measure. All education should, therefore, begin with the analysis of students. Individuals may differ in various ways, in body and mind, in taste and temperament. The guidance movement has continually emphasized the need for the analysis of individual student by teacher and counsellor in order to obtain a better understanding of him. Differential prediction demands this analysis of individuals with an eye to guidance.

In the multipurpose system of education the question of differential prediction has assumed a great importance. This issue depends upon the assumption that there are individual differences in abilities, aptitudes and personality. Differential prediction demands an insight into human nature.

it assumes that a pupil may develop more successfully through one particular subject group.

It is really difficult to determine the correlates of success in different courses of study and vocations. Different approaches have been made towards this problem. One of the major problems in the field of differential psychology is that of finding out individual differences and abilities. It should also be kept in view that besides abilities, there are many other traits and qualities which deserve special attention of the psychologists. For example, the personality aspects, including attitude, interest motivation and level of aspiration have got significant bearing on this problem. In other words, the individual differences in various fields should be analysed for the purpose of allocation to diversified courses. Our problem is to know what types of differences will lead to what result. The major issue is, therefore, to find out a scientific basis of this allocation by means of researches. If we consider the correlation between achievements in different courses and the general abilities it will appear that different streams of diversified curricula demand different qualities. In U.K. there is some emphasis on intelligence, and a higher degree of abstract intelligence is still considered to be the indicator of one's success in Grammar School. This is, of course, based on a big assumption. But there may be some truth behind this, though the supremacy of intelligence or mental ability in the field of attainment has been doubted. Today the democracy in education has carried a new message, and Dr. Fleming has echoed the view in the following lines: "All adolescents are capable of benefiting satisfactorily by continued education of widely diversified types." Many psychologists have put forward different arguments in favour of differential prediction. G. Kerr has been able to show that formation of distinct clusters like linguistic, technology arts is found with reference to achievements in different subjects. This view has been supported by Earle who has discovered certain bonds of connection between groups of school subjects. King has critically analysed the school certificate examination results and admitted the bi-polar nature of the concrete mental ability beside abstract verbal ability. Further researches on this have been carried out by Buruhama and Crawford who have shown the following types of clusterings :

(*a*) Ability of verbal comprehension—The Humanity.
(*b*) Ability to produce verbal images fluently and abundantly (W)—Literature.
(*c*) Ability to solve quantitative problems (R)—Exact Science.
(*d*) Ability to produce quantitative images fluently and abundantly (N)—Music.
(*e*) Ability to solve concrete problem (S)—Technology.

(*f*) Ability to produce visual images fluently and abundantly (P)—The Fine Arts.

But the differences in ability may not provide the entire clue to differential prediction. There are other considerations as besides psycho-dynamics.

It is an admitted fact that differential prediction assumes that all the potentialities of a will be manifest at a certain stage of adolescence. Much, however, depends upon environment.

But, what are the potentialities and how can they be discovered ? It appears that interest has received recognition from many psychologists from the standpoint of guidance. Different areas of interest have been brought out as a result of work done by Allport and Vernon, Kuder, Strong, Lambert, and others.

But they do not totally correspond to the different streams introduced in our multipurpose schools. On an analysis, however, it appears that the four streams of diversified courses, viz., humanities, science, technical and artistic and musical, have some psychological basis.

In that case, other streams do not find their full justification from the psychological point of view, though they may serve the sociological needs of our country. Besides interest, there are various other traits which demand special attention. It is extremely difficult to find out all the possible correlates of success, but an effective differential prediction demands a close survey of mental abilities with an eye to the purpose.

Part II

SCIENTIFIC BASIS OF GUIDANCE

CHAPTER FIVE

The Concept of Interest

INTRODUCTION

WITH the introduction of diversified courses in the multipurpose schools of India, the question of allocation of courses has assumed much importance. Thus the need for finding a scientific basis for educational guidance is now recognised.

The writer has, therefore, undertaken the present study of inter-relation between interest, persistence and attainments. It has been felt that intelligence is not the only factor contributing to the success in any field. Because of this inadequacy of intelligence test to perdict one's attainments the interest of the writer in the present investigation has been particularly aroused.

It has been admitted on all hands that among personality characteristics, persistence and interest have significant bearing on attainment. But how to assess them?

The importance of interest in the guidance programme has been admitted by Burt,[1] Spearman and Thomson. Burt considers these type-differences shown by the pupils of different schools, to be the effects of abilities, interests and temperamental qualities, while Spearman[2] and Thomson[3] attribute them to the accidental acquirement of special knowledge and interests.

Within the writer's knowledge, there appears to exist no such test which has been validated in this country for the objective assessment of persistence and interest of pupils of 13 to 17 age-range. This is why the task has proved difficult as the construction and validation of necessary tests demand much time and energy.

Validation of tests is one of the outstanding problems and this has been attempted in the present experiment by examination and analysis of the data obtained from experiments. A pilot study was conducted for the purpose and the tests for the assessment of persistence and interest had to undergo

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[1] Burt, C., "The Psychological Implication of Norood Report" *British Journal of Educational Psychology*, 1943, Vol. XIII, pp. 126-40.

[2] Spearman, C., *The Abilities of Man*. London. Macmillan, 1927.

[3] Thomson, G. H., *Factorial Analysis of Human Ability*, London, University of London Press, 1939.

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the process of validation. The tests were then applied in the main experiment and administered on different streams for obtaining both interest and persistence scores and comparing them against respective school attainments.

An account of the researches and results obtained are reported in full in the following pages.

WHAT IS INTEREST ?

In studying interest, one is concerned with enjoyment or satisfaction. Experimentally an interest is a response of liking. It is an index of motivation according to many. McDougall on this point seems to be doubtful as to its nature. He asks, "What is interest ?" Is it an agent, an entity, or faculty that we have hitherto overlooked ?

Interest is a vague word according to him but the facts implied by it are very important. As pointed out by Strong,[4] interest is an indeterminate indicator of success. In his opinion, the reason for this indeterminateness is to be found in the fact that it is an activity, indicator of satisfaction but not necessarily of success; it is an activity which may be liked or disliked.

The term interest can also be interpreted from many other angles. It could be treated as a cognitive experience—a subjective one depending upon the activity of the particular apperception mass in question and the intensity of the stimulus arousing it. Interest can also be regarded as a conative phenomenon, as much depends upon motivation or drive.

In the opinion of McDougall, interest being essentially conative is a matter of enduring settings of our conative tendencies or impulses and is therefore, determined by our instincts and sentiments. In this connection, Thorndike's study deserves special mention. According to him, interest is the result of past experience—a feeling towards the satisfier. He clearly identifies interests with likes.

Besides, the operational concept of interest appears to be very practical for the purpose of guidance. Fryer[5] has put it clearly. To him objective interests, in a measurement sense are positive reactions and objective aversions are negative reactions to stimulating objects and activities of the environment. According to some, interest is mainly a cognitive experience—a mental condition to be labelled under such. There are others who consider interest as an emotive phenomenon because of the existing relation of interest with the goal of human efforts, a motivation in response to one's needs and wants. Baldwin is one of those who sees a considerable influence of the feeling tone or emotion in the field of interest and defines the term as "the intellectual feeling which is the result of the consciousness which accompanies the direction of mental tendencies. "The hormist school, of course, laid emphasis on the conative aspect and describes interest to be active and projective." Dewey affirms that genuine interest is the accompaniment of the identifications, through action, of the self with some object or ideas, because of the necessity of the object or idea for the maintenance of a self-initiated activity. The genuine principle of interest is the principle of the recognised identity of the fact or proposed line of action with the self.

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[4] Strong, E. K., *Vocational Interests of Men and Women*, p. 6.

[5] Fryer, D., *The Measurement of Interests*, London, 1931, p. 16.

According to Vernon "an interest is just as complex as an amalgam of subjective feelings and objective behaviour-tendencies, and interests are at least as manifold and as difficult to reduce to a few undimensional variables".[6]

In spite of the various investigations in the field of interest, there are certain pertinent questions which deserve special attention.

(*a*) Is interest dynamic? Does the interest of a person change throughout the life owing to the influence of environmental factors or is some interest-pattern formed in every individual at certain stage of life? If so, what is that stage?

(*b*) Are interests innate or acquired? If they are innate, to what extent are they so?

(*c*) What are the psychological elements involved in interest? The above fundamental questions are really perturbing as their answer demands a thorough enquiry and long investigation. But the advance so far made in this field is not sufficient to offer any conclusive evidence.

There is really a scope for doubt as to whether one's interest can be taken as a considerably stable mental phenomenon after a certain age-level. It is the common experience that many shift their centres of interest even at a considerably advanced age for the sake of better adjustment to the life situation. Is it then the question of need which guides very often the formation of interest? Or is there any innate disposition or potential tendency determining one's interest? The relevant researches in this line are, of course, based on the assumption that "interest" is an aspect of behaviour which involves a psychological mechanism dormant or aroused. Strong also supports this view by saying that interest, like attitude and habit "are stabilised sets of dispositions resulting from experience and determining resulting behaviour.[7] But he admits that though they involve stabilised patterns still they may be modified by re-education. Thorndike has also endorsed this view as he concludes: "The results of our experiments support the conclusion that a person can be taught new attitudes and interest."[8]

[6] Vernon, P. E., *Personality Tests and Assessments*, p. 161.

[7] Strong, E. K., *Vocational Interests of Men and Women*, p. 8.

[8] Thorndike, E. L., "The Interest of Adults", *Journal of Educational Psychology*, 1955, pp. 26, 206.

But, it is also a fact that some show definite inclination towards specific types of activities from their childhood and retain the same throughout their life while some develop new sense of values at certain ages. There are many who hold that unfolding of interest is gradual.

It appears, therefore, that interest depends to a certain extent upon external factors, and environment has a large part to play in the formation of interest. The social heredity of a person, the relative values attached to types of activities by the society at large, should then have enormous influence upon the development of one's interest.

Strong has, of course, produced research evidence in support of the permanence of interest. It is almost a foregone conclusion that "there is great specialisation of interest. He admits that "it is possible, however, to recognise general interest" though the items on an interest test considered singly, go to prove the existence of specific interests.

There have been attempts to classify interest into different types. But the most popular classification is based on the assumption that interest—experience consists of congnitive, conative and emotive elements. Thus three types of interests have been suggested by Fryer. According to him, expressed interest is the verbal profession of interest in an object, activity, task or occupation.

Fryer classifies specific interests and concludes that the expressed specific interests of children and adolescents are unstable and do not provide useful data for diagnosis or prognosis.

Manifest interest is synonymous with participation in an activity or occupation though the term has not been used as a predictor of interest in many studies.

Tested interest is used to refer to interest as measured by objective tests as differentiated from inventories which are based on subjective self-estimates. Besides the general fundamental classifications, e.g., inventoried interest, vocational interest, academic interest, play interest, etc., there are detailed classifications. The following list will show some of the classifications :

Thurstone : Science, People, Language, Business.
Allport and Vernon: Theoretical, Social, Economic, Political, Artistic, Religious.
Strong : Science, People, Language, Things and People, System and Contract.
Kuder : Scientific, Literary, Mechanical, Clerical, Computational, Artistic, Musical.

It is thus observed that certain stable personality traits allied to motives, have invited the attention of many psychologists though the exact nature of these mechanisms is not usually described in detail.

Carter's study[9] of twin resemblances suggests that there may be some hereditary influences in the development of interests, although of course, such resemblance studies do not conclusively prove an inherited basis. According to him, interests reflect differentially assimilated aspect of the culture as well. Freeston[10] on the other hand, suggested that interests of children are often dominated by the desire for escape from humdrum work.

Previous Researches on Interest

There is hardly any scope for doubt as to the influence of interest on attainment. But one may ask "to what extent can interests be regarded as predicators of one's future attainments ?"

There have been many researches on the study of interrelation between interest and success in the examination or abilities.

Among the many who have thrown light on this field, the name of Fryer deserves mention. According to him, interest in specific subjects has definite bearing on self-estimated abilities in the same field. A positive correlation of .60 and .30 has been found by him between interest on the one hand and self-estimated abilities and grades on the other.[11]

Similarly, the report of Berdie[12] endorses the conclusions arrived at by Fryer. The correlation of .23 between college honour point ratios in engineering and curriculum satisfaction scores is rather significant. Attempt has also been made to find out the amount of correlation between the interest scores on the literary scale of the Kuder Preference Record and grades in English, History and Science. The correlations were .25, .13 and .01 respectively. In the attempt, Hake and Ruedisili[13] have put forward reasons as to why they think favourable about the predictive value of Kuder Preference Record. They have also been supported by Rommey[14] who also found significant correlations. Similarly, Strong. Blank was found considerably useful in predicting success by Ostrom.[15]

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[9] Carter, H. D., *Vocational Interests and Job Orientation*, p. 10.

[10] Freeston, P. M., "Vocational Interests and Elementary School Children," *Occupational Psychology*, London, 1939.

[11] Fryer, D., *The Measurement of Interests*, New York, Vol. I, 1931.

[12] Berdie, F. E., "The Prediction of College Achievement and Satisfaction," *Journal of Applied Psychology*, 1944, 28, pp. 239-45.

[13] Hake, D. T. and Ruedisili, "Predicting Subject Grades of Liberal Arts Freshmen with the Kuder Preference Record", *Journal of Applied Psychology*, 1949, 33, pp. 553-58.

[14] Rommey, A. K., "The Kuder Literary Scale as related to Achievement in College", *English Journal of Applied Psychology*, 1950, 31, pp. 40-41.

Investigations have also been made to find out the correlation of interest with other factors, viz., intelligence, scholarship, etc. Fryer also reports that Jacobsen found a positive correlation of interest with both scholarship and intelligence. Klugman's[16] investigation shows that the relationship between "spread of vocational interest" on the Kuder Preference Record and different variables such as intelligence, adjustment and education is not always positive. Earle[17] in his questionnaire study with 487 university students and near about 1200 teachers' training college students indicates the positive correlation between definite vocational aims and distinctive interest-attitude patterns. Kelly and Fiske[18] also report significant correlations between the Strong Interest Blank and various other criteria of success in the field of clinical psychology.

Shaffer[19] in his study of various sub-groups of business students showed fairly distinctive interest patterns on the Kuder Preference Record on its different scales. The same was found to be useful also in the discrimination of students of business administration from other students.

Thorndike[20] has studied adult interests by such a test designed to cover thirty-nine topics or fields. The items include names of occupations, amusements, school subjects, activities peculiarities of people, order of preference among activities, types of persons admired, etc. One's likes, dislikes, indifferences, choices and preferences are to be recorded against each item. The test is reliable and valid though the scoring principle is rather laborious.

Jacobsen[21], Van Tuyl and Eurich[22] have also proceeded in similar lines with an eye to curricular guidance.

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[15] Ostrom, S. R., "The OL Key of the Strong Vocational Interest Blank for Men and Scholastic Success at College Freshmen Level", *Journal of Applied Psychology,* 1949, 33, pp. 51-54.

[16] Klugman, S. F., "Spread of Vocational Interest and General Adjustment Status", *Journal of Applied Psychology,* 1950, 34, pp. 108-14.

[17] Earle, F. M., "A Study of Attitudes and Interests (University and Training College Students), *British Journal of Educational Studies,* 1953, 1, 2, pp. 154-63.

[18] Kelly, E. L. and Fiske, D. W., *The Prediction of Performance in Clinical Psychology,* University of Michigan Press, 1951.

[19] Shaffer, R. H., "Kuder Interest Patterns of University Business School Seniors". *Journal of Applied Psychology,* 1949, 38, pp. 489-93.

[20] Thorndike, E. L., "The Value of Reported Likes and Dislikes for Various Experiences and Activity as Indications of Personal Traits", *Journal of Applied Psychology,* 1936, 20, pp. 285-313.

[21] Jacobsen, Marion M., "The Quantitative Determination of Scholastic Interests Among College Students", Unpublished Ph.D. Thesis, University of Minnesota, 1928, p. 181.

[22] Van. Tuyl, K. and Eurich, A. C., "Measuring the Interests of College Students with Different Major Subjects", *Journal of Applied Psychology,* 1934, pp. 27-44.

There have been a few other attempts by persons like Clark[23] and Garretson[24] for differentiating interests. Garretson's attempt to measure the academic, technical or commercial interests of secondary school boys is of special significance to us, because of their direct bearing on the proposed investigation.

A number of studies has appeared for predicting choice of curricula, though some of them are based on new tests. Out of these, the Young-Estabrook[25] scale for measuring studiousness and Dulap Academic Preference Blank[26] for similar purpose, deserve special mention. That the Allport-Vernon study of values is effective for the prediction of scholarship has been proved by Duffy and Crossy.[27]

Another Interest-Inventory discriminating between students engaged in engineering and agriculture has been constructed by Garrison.

The tests recently published by Guilford, Shneidmann and Zimmermann[28] are known as GSZ Interest Tests which include twenty items designed to measure each of eighteen types of vocational and leisure interests.

A number of tests seems to be built around the idea that interests represent details of effective response, dependent upon experience. Weber and Wyman[29] devised an indirect test of interests which was based on free word association responses.

Thus in several countries attempts have been made to assess interest for the purpose of selection of guidance. Fryer brings together most of the researches on interest before 1930 and Strong brings the analysis up-to-date. In addition, the work of Kuder is of importance because of its influence upon measurement techniques, and Ginzberg and Super for their attempts to assess the true role of abilities and vocational interests in the choice of a career. Ginzberg considers that occupational choice is a process of continuous development. It ends in a compromise between the influence of interests, abilities, a scale of values concerning job attributes. At the school leaving age there is a period of realistic choice when alternative occupations are finally considered and a specific job chosen. Super considers that the special contribution of the successive dominance of interests abilities and job attributes as determinants of choice before reality begins to play a major role.[30]

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[23] Clark, C. D., "Intelligence—As a Factor in Occupational Choice", *American Social Review*, 1938, pp. 683-94.

[24] Garretson, O. K., "Relationship Between Expressed Preferences and Curricular Abilities of Ninth Grade Boys-teachers", *College Contr. Educ.* 1950, No. 396.

[25] Young, C. W., and Estabrook, G. H., *Young Estabrook Scale for Measuring Studiousness by means of the Strong Vocational Interest Blank for Men*, Stanford University, California, Stanford University Press, 1936.

[26] Dulap, J. W., "Preference as Indicators of Specific Academic Achievements", *Journal of Educational Psychology*, 1955, pp. 411-15.

[27] Duffy, Elizabeth and Crossy W. J. E., "Evaluative Attitude as Related to Vocational Interests and Academic Achievement", *Journal of Abnormal and Social Psychology*, 1940, pp. 26-45.

[28] Guilford, J. P., Shneidmann, E. S. and Zimmermann W. S., "The Guilford Shneidmann Interest Survey", *Journal of Counselling Psychology*, 1949, 13.

[29] Wyman, J. B., "The Measurement of Interest", *Vocational Guidance Magazine*, 1929, pp. 54-60.

Super agrees with Strong that individuals vary considerably in their interests, abilities and personalities and are qualified by virtue of these characteristics to succeed in a number of occupations.

In countries like England, Australia and Holland, approaches have recently been made to this problem. Tests which are easy to administer have been developed in those countries for use in schools. Fleming has developed a test (P.A.I.) designed to assess the preferences of school children for objects, ideas or people who have been used to guide children to courses with technical and other types of bias. The items are presented in the form of statements which are grouped under different headings.

Lambert and Peel have also developed a test to distinguish between children who would be best advised to opt for either a broadly academic or technical curriculum. In form it is an information test which is divided into three main sections.

The Lambert-Peel general information test, together with tests of practical and academic ability and attainment, were administered to the top 30 per cent of ability of the 11-year age group throughout the country of Northumberland. The total sample numbered 481 boys drawn from rural, urban and industrial areas. The original test data showed that the bias of interest on the part of the whole group was towards an academic curriculum.

In Holland an investigation was made to isolate interest patterns which discriminated between the groups of children going to different types of secondary schools, and to use interest measures to predict success in the chosen school courses.

The instrument used in the investigation was a Dutch adaptation of a vocational interest test originally developed in Germany by Irle. The test included 162 items grouped in the Kuder[31] method. The data derived suggest distinctive interest patterns.

In Australia, an investigation attempted to assess secondary school pupils' vocational preferences in Tasmania by the use of Rothwell-Muller Vocational Interest Blank.

Thus among the number of researches in this line Strong's is the classic one. His Vocational Interest Blank solves the problem of what to measure by taking different occupations as the criterion. There are four hundred items in the Strong's Vocational Interest Blank for men, and four hundred and ten in women's form. But the general types of interest have hardly been objectively determined. Many types of value or general interest have, however, been taken into account by Allport and Vernon, and the classification has been made in the line of Spranger in his "types of men". There are six types of value or general interest, theoretical or scientific, economic or utilitarian, aesthetic or artistic, social or humanitarian, political or power-seeking and religious or spiritual, where evaluative attitudes have been emphasised. Here in the present investigation also the following six types of interests have been taken for assessment: (*a*) Academic, (*b*) Scientific, (*c*) Technical, (*d*) Commercial, (*e*) Artistic and (*f*) Agricultural.

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[30] Wiegersma, S., and Barr, F., *Interest Testing in Educational and Vocational Guidance.*

[31] Fleming, W. G., *The Kuder Preference Record—Vocational, as a Predictor of Post High School Educational Occupational Choices,* Tororts.

The Kuder Preference Record is another device which aims at measuring five more specifically occupational interests: artistic, literary, musical, social science and clerical. This record is built around the idea that one can measure preference for types of activity and each preference has a vocational significance. The concept involved in the approach is, no doubt, valuable but the test itself is inadequate. The present work has, therefore, been devoted mainly to construct a comprehensive test battery for the assessment of interest and persistence.

A review of the studies on interest does not offer a very clear and definite idea of the exact nature of interest. This is perhaps due to the different dimensions of what we call interest. Thus interest has been interpreted from many angles. Some have emphasised the cognitive aspects and the conative aspect has been emphasised by many. There are others who have recognised the importance of the emotional phase of interest. According to them interest is mainly a feeling developed towards the satisfier. Thus Thorndike connects interest with the law of effect and takes it as the feeling which accompanies a satisfier. On a critical analysis it appears that environment has a larger part to play in the development of interest. Much depends upon the satisfaction of certain needs in course of adjustment. But does that mean that one's interest is so dynamic as to make any attempt for its assessment futile? As pointed out by Vernon it is really difficult to assess interest. There is, of course, some ground for optimism as certain consistency on the behaviour tendency has been observed by many.

There is a justification for assuming that there are innate propensities finding their expression in different forms. One may have an urge for creativity, while others may have urge for manipulation of concrete objects, viz., tools. But these are very broad channels of expression.

It is really doubtful whether there are so many interests as there are fields of operation. But the general propensities may gradually be reinforced into specific forms in interaction with the environment. Thus behaviour changes in adolescence find expression in shifts in interests, attitudes and values. Many of these changes reflect the individual's endeavour to adapt himself to behaviour which is expected by society of a more mature individual. Interest appears, therefore, to be a very flexible concept. It has been assumed that interest, unless it is manifest, does not take a definite pattern.

It is interesting to note that the flexible concept seems to be now surrendered to the mechanical outlook of a behaviourist with the emphasis on vocational and educational guidance. The success of the psychometric methods in intelligence and aptitude measurement has stimulated the operational concept of interest and encouraged attempts to measure interest objectively.

The following tentative definition of interest which has been kept in view for the present investigation is in keeping with Strong's concept : "Interest is a behaviour tendency which is nothing but an expression of satisfaction of certain needs innate or acquired in course of adjustment to the environment."[32]

Both psychological and sociological approaches have thus been made to this problem and it appears that the latter approach has greater influence on the present attempt.

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[32] Strong. E. K., *Vocational Interests of Men and Women*, p. 23.

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CHAPTER SIX

The Concept of Persistence

EYSENCK STATES with emphasis : "Among the qualities which make for the efficient use of a person's abilities is his persistence".[1] Eysenck's view is also supported by Fernald. "The success or failure of individuals depends largely on the ability to endure and continue to strive for the sake of achievement, in spite of fatigue and discouragement".[2]

The importance of persistence in education has been recognised by many though its nature and dimension await further exploration.

Allport rightly observes : "The belaboured concept of involuntary perseverance was the psychologists' timid, half-hearted gesture towards a troublesome but inescapable problem in personality. The concept of persistence is far bolder and in the long run should prove sounder".[3]

The term "persistence" has been suitably defined by MacArthur in his investigations as "the virtue by which an individual continues in steadfast pursuit of an aim, in spite of difficulties or obstacles".[4] As early as 1915, Webb described such a factor "W" or Will-persistence.

Cattel's Factor "C" is similar. In discussing the assessment of personality, Burt says that among other considerations, "The psychologists have to consider three things",[5] one of which is "the strength of persistence." Fleming [6] lists persistence as one of the personal attributes for assessment of school pupils. The National Foundation of Educational Research[7] lists persistence as one of seven temperamental qualities for assessment and recording. Thus there is little doubt about its importance, but there is hardly sufficient research evidence as to its unitary existence independent of any other trait. Several researches have been done on persistence-tests and here too some authors find very little overlapping, and others break the trait into distinct group factors or types of persistence. Ryans concludes that the assumption of a general factor is justified.

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[1] Eysenck, H. J., *Dimensions of Personality*, 1947, p. 158.

[2] Fernald, G. G., "An Achievement Capacity Test", *Journal of Educational Psychology*, 1912, III, p. 331.

[3] Allport, G. W., *Personality—A Psychological Interpretation*, p. 418.

[4] MacArthur, R. S., "An Experimental Investigation of Persistence and its Measurement at the Secondary School Level", Unpublished Ph.D. Thesis in Education, London University, 1951.

[5] Burt, Cyril, "Symposium on Personality. I. The Assessment of Personality", *British Journal of Educational Psychology*, 1954, XV, p. 10.

[6] Fleming, G. M., *Cumulative Records—Notes on Their Content and Use*, pp. 43-44.

[7] *The National Foundation of Education Research, School Record Section 5.*

The question of generality or specificity of persistence is a debatable one; much of the research on it produces contradictory evidence. Thus one begins to wonder whether persistence is really a general quality or is specific to situations. Thornton[8] suggests: "A better question to ask is how general is persistence and what is meant by persistence? The two questions of how general is persistence and what is meant by persistence are interdependent problems."

Eysenck[9] suggests that ultimately we may reach agreement by framing the question this way: "How general and how specific?"

MacArthur's research on persistence in the University of London shows that about 50 per cent of the variance can be explained by the presence of common factors.

In view of the importance attached to persistence, it is not surprising that there have been many attempts by psychologists to delineate and measure this particular trait.

PREVIOUS RESEARCHES ON PERSISTENCE

Among the experimental approaches towards the study in this line, the earliest was the investigation of Fernald[10] in 1912 on 12 non-delinquents and 116 delinquents who were asked to stand on tip-toe as long as possible. This was a rough attempt to measure the ability to endure physical fatigue, and to draw conclusions about general endurance or persistence. Bronner made an attempt along similar lines in 1914.

But a more interesting and perhaps a rational approach was that of Webb in 1915. He studied a large number of a students and ascertained the correlations between ratings on a large number of intellectual and character qualities. It appeared that there exists a high correlation between different character qualities like "tendency not to abandon tasks," trustworthiness, and consciousness, etc. This led him to believe in the existence of a general character factor which he called "W." This investigation was open to the criticism that the general factors might be mainly due to "halo".

The Downey Will Temperament-Tests[11] relied upon links between handwriting and personality traits, but in spite of its novel features, this test

[8] Thornton, G. R., "How General is the Factor of Persistence", *Journal of General Psychology*, 1940, XXXII, p. 188.

[9] Eysenck, J., *Dimensions or Personality*, p. 159.

[10] Fernald, G. G., "An Achievement Capacity Test", *Journal of Educational Psychology*, 1912, III, pp. 331-36.

[11] Downey, J. E., *The Will Temperament and its Testing.*

was not generally accepted. As Ryans put it, "we may conclude that the Downey-Will Temperament-Test. . .is not a suitable measuring instrument for traits of persistence".[12] The next significant investigation was that of Morgan and Hull in 1926.[13] In this investigation the judges were asked to rate 100 pupils on a scale of persistence consisting of nine qualitative grades, on the basis of observations in different test situations and settings. The report presented by Morgan and Hull shows that ratings obtained by this method are highly valid, and they consider that similar qualitative methods are the most promising for persistence assessment.

INTRODUCTION TO THE STUDY OF PERSISTENCE

With the introduction of diversified courses in the multipurpose schools of India, the question of allocation of courses has assumed much importance, as increasing need for finding a scientific basis for educational guidance is being felt more and more.

The writer has, therefore, undertaken the present study of inter-relation between interest, persistence and attainments. It has been felt that intelligence is not the only factor contributing to the success in any field. Because of this inadequacy of intelligence test to perdict one's attainments, the interest of the writer in the present investigation has been particularly aroused.

It has been admitted on all hands that among personality characteristics, persistence and interest have significant bearing on attainment. But how to assess them?

The importance of interest in the Guidance programme has been admitted both by Burt, Spearman and Thomson. Burt[14] considers these type-differences shown by the pupil of different schools to be the effects of abilities, interests and temperamental qualities, while Spearman[15] and Thomson[16] attribute them to the accidental acquirement of special knowledge and interests.

The Hartshorne-May-and-Maller[17] study of self control reported in 1929, made a very remarkable contribution. Eight tests of various types, viz., pencil and paper, performance, etc., were applied. The reliability of the battery of group tests was .89 and the total score on the group tests correlated .23 with reputation for persistence. The individual tests intercorrelated .11 to .10. The research unlike most of the previous researches boldly faced the Generality-Specificity problem. It concluded: "If our language customs permitted, we should learn to speak of persistences rather than persistence."[18]

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[12] Ryans, D. G., "The Measurement of Persistence. An Historical Review", *Psychological Bulletin*, 1939, XXXVI, p. 718.

[13] Morgan, J. J. E. and Hull, H. L., "The Measurement of Persistence", *Journal of Applied Psychology*, 1926, X, pp. 180-87.

[14] Burt, C., "The Psychological Implication of Norood Report", *British Journal of Education Psychology*, 1943, Vol. XIII, pp. 126-40.

[15] Spearman, C., *The Abilities of Man*, 1927, London, Macmillan.

[16] Thomson, G. H., *Factorial Analysis of Human Ability*, 1939, London, University of London Press.

[17] Hartshorne, H., May and Maller, *Studies in Service and Self-Control*, 1928-30.

Crutcher's [19] study of persistence in 1934 is an attempt to find the relation of persistence to mental defect, introversion and intelligence. He attempted to estimate persistence through situation tests and tasks like card-house building, mechanical puzzles, picture copying, etc. But his findings led him to significant consideration that there is not a general trait of persistence, but that intelligence, perseverance, determination, special abilities and specific factors influence the degrees of persistence possessed. Another important study in this line was that by Alexander [20] in 1935. His "X" factor looked like persistence and appeared to include persistent behaviour.

Among the factorial investigations of persistence, Ryans' is the most exhaustive. He used eighteen measures and found three factors after factor-analysis—the first of which showed the highest loadings on persistence rating. This he interprets as a "persistence factor". From this study he concludes that there appeared as a result, seeming evidence of a general factor of persistence. The persistence factor seemed to be relatively independent of such other capacities as intelligence and perseverance.[21] In a later study [22] positive correlations between persistence, school success and verbal ability were found. In a further study he has given an indication of the possibility of a relationship between persistence on the one hand and emotional stability, extroversion and confidence in the self as measured by the Bernreuter Inventory on the other.[23]

But Thornton [24] in 1939 raised objections to this factor analytic study

[18] *Ibid*, p. 442.

[19] Crutcher, R., "An Experimental Study of Persistence", *Journal of Applied Psychology*, 1939, XVIII, p. 664.

[20] Alexander, W. P., "Intelligence Concrete and Abstract", *British Journal of Psychology*, Monograph Supplement 1935, XIX.

[21] Ryans, D. G., "An Experimental Attempt to Analyse Persistent Behaviour. Measuring Traits Preserved to Involve Persistence", *Journal of General Psychology*, 1938, XIX, pp. 333-53.

[22] Ryans, D. G., "A Study of the Observed Relationship between Persistence Test Results. Intelligence Indices and Academic Success", *Journal of Educational Psychology*, 1938, XXIX, pp. 573-80.

[23] Ryans, D. G., "A Tentative Statement of the Relationship of Persistence Test Score to Certain Personality Traits and Measured by the Burnreuter Inventory", *Journal of Genetic Psychology*, 1939, pp. 229-34.

[24] Thornton, G. R., "How General is the Factor of Persistence? Are Examination and Revaluation of Ryans Results", *Journal of General Psychology*, 1940, XXXIII, p. 188.

because of the small size of the population. He himself carried out an investigation on 189 American college students of 19 to 26 years of age. The tests, twenty-two in all, included ten objective measures in addition to ratings, etc.

But he considers that the correlations between the tests used are too low to justify the conception of a common factor of persistence. Another investigation of this type was that of Rethlingshafer.[25] But Kremer's [26] study is perhaps more interesting to us. His analysis throws some light on the present investigation. His persistence test battery had a reliability of .85 and the rating scale had one of .77. There was also an indication of general underlying factor running through the entire persistence battery.

It is thus to be observed that the four-factor-analytic studies, viz., those of Thornton, Rethlingshafer, Ryans, and Kremer, are of considerable importance and significance. These four studies suggest that there is an underlying order within the domain of persistence behaviour.

Among post-1937 studies on persistence Wetherill's [27] in 1946 is striking because of its value in the field of education.

The merit of this work lies in the method adopted for assessing the trait of persistence. Ratings, according to Wetherill, serve as useful auxiliary instruments for selection and he has suggested a number of ways by which ratings can be efficiently employed.

Another important contribution was Eysenck's [28] work published in 1947. In a large factorial study of ratings on a variety of personality tests he found two main factors; they were labelled "neuroticism" and "extroversion-introversion." He next attempted to discover suitable tests for the measurement of these two factors, one of which appeared to be linked with persistence. He gave a shorthand version of the Wang questionnaire to a population of 25 male and 25 female hysterics and 25 male and 25 female lysthmyics,[29] but the result was rather disappointing as this instrument did not distinguish between the groups. Another interesting finding by Eysenck is that the Wang questionnaire, actually measured neuroticism instead of persistence. His remark that "there can be little doubt that no definite conclusions can be based on questionnaires of this kind . . . and we must turn to more objective studies in order to obtain such a picture" is worth consideration. The difference between Eysenck's and Maller's measures of persistence may be roughly described by saying that Eysenck's measure

[25] Rethlingshafer, "The Relation of Test of Persistence to Other Measures of Continuance of Activities", *Journal of Abnormal and Socio Psychology*, 1942, pp. 7-82.

[26] Kremer, A. H., *The Nature of Persistence—Studies in Psychology, and Psychiatry*, 1942, VIII, p. 40.

[27] Wetherill, A., "The Significance of Long Term Persistence to Successful Attainment in the Grammar School", Unpublished Master's Thesis, Leeds University, 1948.

[28] Eysenck, H. J., *Dimensions of Personality*.

[29] *Ibid.*

of persistence was of the physical type whereas Maller's was of the verbal, numerical and spatial types. Both these investigations showed different approaches but the findings were similar.

In this connection Adcock's[30] attempt in 1947 to carry out a cluster-directed factor analysis of tests of temperament and a self-rating questionnaire deserves mentioning. According to him persistence is a quality which involves two factors, viz., intensity of drive and obsessional tendency. In 1948 French[31] got some encouraging results with engineering students on applying a device known as the Ingenuity Tests.

But still more novel perhaps is the projective technique in the field of assessment of personality. Vernon[32] says: "Projective testing arose indeed partly as a revolt against the search for tests of particular traits, because it seemed to yield insights into the structure of the personality as a whole." Rosenzweigh's[33] Picture-Frustration study suggests another possible approach to the problem. In this test different situations were presented by means of cartoons. The subjects were asked to respond to each situation and it was expected that they would project themselves in every situation. But the question is that of objectivity of these techniques, though an attempt has here been made to reduce the subjectivity of interpretation to a certain degree by giving samples of scoring.

Among very recent investigations MacArthur's[34] work deserves special mention. His enquiry mainly centred round the question of generality-specificity of persistence. Another aim of his research was to find out whether there exists any relation between school attainments on the one hand and on the other, persistence and such other personality qualities. Vernon[35] says in connection with his work: "In a very thorough research on London Secondary School boys (of 14-16 age range) MacArthur recently demonstrated a strong persistence factor on objective tests and ratings (together with subsidiary group factors) and found that this as well as intelligence contributed to school achievement." Twenty-two persistence measures were selected. Of these 15 were objective tests,—for the measurement of the general persistence factor.

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[30] Adcock, L. J., "Factorial Analysis of Temperament", Unpublished Thesis, University of London, 1947.

[31] French, J. W., "The Validity of a Persistence Test", *Psychometrica.*

[32] Vernon, P. E., *Personality Test and Assessments*, p. 162.

[33] Rosenzweigh's, *The Picture Association Method and its Application in a Study of Reactions to Frustration*, Char & Person, 1945, pp. 2, 14.

[34] MacArthur, *An Experimental Investigation of Persistence and its Measurement at the Secondary School Level.*

[35] Vernon, P. F., *Personality Tests and Assessment*, 1593, p. 14.

CHAPTER SEVEN

The Theoretical Framework

AIM AND SCOPE OF THE INVESTIGATION

THE NEED for assessment of individual difference is being felt more and more. The scope for such an investigation has been increased because of its bearing on the guidance programme in our country.

The present investigation entails the construction and validation of suitable tests for objective study of interest and persistence and as such there is a further scope of standardisation of these tests for wider use.

Educational guidance demands a scientific basis for its effective functioning. But in this country very little advance has been made in this direction. The scope of the present thesis lies within the field of query as to what are the correlates of success.

It is perhaps the experience of many engaged in the field of education that difference in attainments is not only due to individual difference in intelligence, but in other traits of personality as well.

The general aim of the thesis has, therefore, been to find out some determinants of success in examination.

It has been assumed that interest and persistence are important factors contributing to ones' attainments. Therefore, the following has been kept in view:

1. To construct test battery for assessing interest. Sub-tests of different types including questionnaire, information test and situational tests will comprise the battery.
2. To construct another test battery including questionnaire and situational test for assessing persistence.
3. To Select suitable criteria for validation of the tests.
4. To make appropriate revision of the tests in the light of the experience derived from the pilot study.
5. To attempt validation of the tests by comparison and analysis.
6. To study inter-correlation between interest persistence and attainments by comparison of the data collected from different institutions.

THE THEORETICAL FRAMEWORK

As the techniques adopted in this investigation consisted of inventories on the one hand and situation tests on the other, it will be proper to construct a theoretical framework. The purpose is to explain all the considerations underlying the construction of the inventories and situation tests and to put forward the arguments in favour of accepting teacher's ratings and responses of the criterion-group as the criteria for validation of tests on persistence and interest respectively.

The questionnaire method of personality study involves a series of questions combined into a single measuring scale. But where is the justification for believing that the responses to a few questions will faithfully reflect one's feelings, dispositions, abilities or traits? In general, alternative choices in the form of "yes," "no" and "?" are supplied and the subject's response is taken at its face value and treated as an index of his actual characteristics under similar circumstances. When an individual acts in the same manner on different occasions, it means that the groups of stimuli presented on these occasions, have the same personal significance for him. This fundamental fact forms the basis of Allport's assumption of Generalized Tendencies within the organism, which he described in short as "traits". Cattel's view of traits is also similar. According to him, trait is nothing but a collection of reactions or responses bound by some kind of unity which permits the responses to be gathered under one term and treated in the same fashion for most purposes.

In the present investigation it can be assumed that personality originates and develops through the interactions of four main sectors: the cognitive sector, the affective sector, the conative sector and the physical sector.

CONSTRUCTION OF THE INVENTORY FOR THE ASSESSMENT OF INTEREST (SUB-TEST NO. 1)

In spite of the fact that inventories suffer from a number of limitations it was considered that the questionnaires may serve some purpose for drawing out relevant information about the likes and dislikes in a particular field. All the questions were intended to place the individuals in such situations that their responses might be of value and significance to the investigator.

The construction of this questionnaire was guided by the theories underlying Kuder Preference Record. The final questionnaire took the pattern of the above card and thus 60 items were placed in different combinations each group containing three different items representing different fields of interest. Instead of getting a list of scattered items responded, the idea of grouping them in order to increase the range of scores, stimulated the investigator, framed the questionnaire according to the above mentioned

Preference Card. There were 60 items designed to measure six different types of interest and arranged in 20 different groups. Most of the items demanded information about the subjects' actual participation in different fields of activities or the feeling about what would be done and how could he react to certain situations.

In short, the questionnaire attempting to draw information about the subject's preference, likes and interest (dominant) by placing the individuals in such abstract situations as would indicate the subject's interests in every sense of the term. The consideration behind the construction of the questionnaire was quite in keeping with Strong's view of interest.

Administration and Scoring. In spite of the written directions at the top of the questionnaire it was considered advisable to make verbal instructions clear before actually administering the test. Uniformity in procedure for administering the tests was another important consideration. The time taken was roughly fifteen minutes for completion.

Scoring. The subject would receive 1, 2 and 3 for his responses indicating least, average and highest preference to each of the questions forming a group. For example, a pupil has indicated his preference in the following manner:

1. Will you sit to draw a picture at the end of school hours? (3).
2. Will you sit upon a watch at the end of the school hours? (2).
3. Will you sit to keep accounts of your family after your school hours? (1).

It will be seen from the above that the subject has expressed his maximum preference to drawing and least preference to keeping accounts. So his score in fine arts in the particular groups will be (3) and that in technical and commerce will be (2) and (1) respectively. The range of scores will, therefore, vary from 10 to 30 as there are 10 items for the assessment of each type of interest. In other words, the testee is asked to rank his order of preference to the three answers to such questions forming each group. The scoring principle is in keeping with that followed in the Allport and Vernon's study of Values.

CONSTRUCTION OF THE INFORMATION TEST (SUB-TEST NO. 2)

This test was devised with a view to serving as one of the subsidiary checks on the assumption that any one keeps a wider range of information in a particular field in which he is more interested than in the one which he has lesser interest. This attempt is quite in keeping with that by E. A. Peel.[1]

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[1] Peel, E. A., "Assessment of Interest in Practical Topics" *British Journal of Educational Psychology*, 1948, XVII, pp. 41-47.

The test contained 36 items of which 6 pertained to each type of interest.

Administration and Scoring. This is a group test to be applied with a clear instruction that all the items should be attempted. Each correct answer will fetch a score of 1 and thus the range of scores for each area of interest is 0 to 6. This subject took about ten minutes for administration.

CONSTRUCTION OF SITUATIONAL TESTS

Though the questionnaire was one of the main techniques for the assessment of interest the test battery was enriched by addition of certain situational tests of *ad hoc* types. As mentioned before, interest has been taken to be "as complex an amalgam of subjective feeling and objective behaviour tendencies."

The investigator, therefore, was conscious of the various dimensions of interest and tried to test an individual's relative standing on six main types of interest through his actual participation in certain standardized activities or situations and analysis of the relative influences of different objects on the individual's mind.

The first situational test (Sub-test No. 3) was constructed with the hope that it would give the investigator greater opportunities to observe the subject's responses to actual life-like situations on the basis of his participation in the activities presented in the test. The items comprising the test have been so selected that they may give indication of the subject's expressed interest in relevant fields. The items either demand some information or his preliminary knowledge in relevant fields and mostly cover the different aspects of each area of interest. For example, the items designed to assess one's interest in Art comprised activities demanding his motivation in drawing some sketches, sense of colour composition, sense of perspectives and proportion. Similarly the items designed to assess one's technical interest consisted of situations demanding subject's familiarity with certain common parts of ordinary things mostly used in everyday life but evoking mechanical or technical interest.

There were originally five items for assessing each type of interest, arranged in different combinations so as to increase the efficiency of the test in discriminating. Three items were originally put in each group and the subject was asked to choose one out of the three. Thus for assessing six types of interest there were thirty items set in twenty possible groups and each group of item would be presented one after another.

Administration and Scoring. For each successful participation in every activity the subject will score one (1) and thus the range of score will be from

0 to 10 in each field of interest. Thus the relative standing on six main types of interest may be deduced from the total scores. In this connection, it is worthwhile to mention that in the twenty groups, each type of interest has been represented sixteen times and as such if in all the groups anyone successfully participates in activities representing the same type of interest, then he will score the highest. This sub-test roughly took twenty minutes for administration.

CONSTRUCTION OF SITUATION TEST (SUB-TEST NO. 4)

The construction of this test was guided by the consideration that one's interest may find expression through one's preference of certain news items to others. Thirty news items pertaining to different fields of interest have been presented in different combinations in twenty groups and the subject is to choose one of the items forming each group, for perusal. The procedure is similar to that followed in the former case (i.e. Sub-test No. 3). The time for administration in this case was fifteen minutes.

CONSTRUCTION OF THE QUESTIONNAIRE FOR ASSESSMENT OF PERSISTENCE

The construction of this questionnaire was stimulated by the consideration that such a test on persistence is rare in this country and as such would be of value if it proved reliable and valid. As this was intended for application and validation in West Bengal this was constructed in Bengali with a view to minimising the language difficulty. The questionnaire originally contained eighteen items which have been constructed with an eye to the particular connotation of the terms. As the term "persistence" may have different meanings to different people it is perhaps wise to describe here, how and in what sense this term has been used in this investigation. As persistence has been tentatively defined here as "a trait by virtue of which an individual continues in steadfast pursuit of an aim, in spite of difficulties or obstacles," the following considerations were taken into account before framing the test items.

A person who is not steadfast quickly gets bored with a job, neither can he be expected to finish a task if difficulty arises. On the other hand, a man who is persistent pays little attention to how long it takes him to finish a job or to what is going around him; he is a person who never rests or feels satisfied until he has got over the difficulty and finished the work he has started. This view of persistence is quite in keeping with that given by MacArthur in his Ph.D. thesis. There has been another attempt to phrase questions in an indirect manner so that the child would not realize that he was revealing himself. The situations chosen were within the experience of an age group and the number of such situations was limited.

Vernon says, "It is a mistake to make the test too long because the testees get bored and respond in a stereotyped manner, failing to consider each item on its merits." The questionnaires were therefore made deliberately short and handy for making them effective from the standpoints of administration and scoring.

Administration and Scoring. Oral instructions are to be given in addition to the written directions on the top of the questionnaire. The necessity for honesty when answering deserves special emphasis.

The subject would receive points each time he underlines the response denoting the presence of the trait measured.

For example, if one underlines "yes" against the question, "Do you like a job which requires a long time for its completion?" he will score(1) because positive response to such a question will indicate the presence of the trait. On the other hand, if he underlines 'no' against the question, "Do you feel unhappy if you are to finish a job when it takes a few years?" he will also get (1) as the negative response to such a question will indicate the presence of this trait. A middle column (?) was provided in order to check guessing and no credit was given to these. The time for its administration was roughly five minutes.

CONSTRUCTION OF QUESTIONNAIRE NO. 2 FOR THE ASSESSMENT OF PERSISTENCE

The idea of constructing another disguised questionnaire appeared to be more psychological. Symond observes, "It is probable that disguised questionnaires are more valid than those which are straightforward in their approach." It seemed desirable therefore, to phrase questions in an indirect manner so that the child did not realise that he was revealing himself. The situations chosen were within the experience of the 14-17 years old boys and girls and might form a story. The story included six situations. In both the questionnaires for the assessment of persistence, it will be seen that the number of items is not large and this was done deliberately.

Administration and Scoring. This sub-test took five minutes for administration. Apparently the subjects scored (1) for the response denoting the presence of the trait. The subjects were required to underline the particular character with which they can identify.

CONSTRUCTION OF THE SITUATION TEST. (FOR THE ASSESSMENT OF PERSISTENCE)

It was anticipated that shortage of time and other circumstances would not allow the investigator to apply existing situation tests of persistence.

The situation test was, therefore, constructed so that its findings might be compared with those of other scalings. The investigator decided to present four types of situation tests to the children at the same time with the clear instruction that they were at full liberty to spend all the time available on any one of them instead of attempting all the four. Alternatively, they were asked to record the order of preference and the time they began and gave up in each case. It was not considered desirable to try to elicit a high degree of original motivation for the tests. At his first meeting with the children, the experimenter told them that he would ask them to play certain games for ascertaining their speed of action. They were also told that they would be given the opportunity to try any of them as long as they liked within the time-limit. Thus the purpose of the situation test was kept concealed, as it was intended to observe them under normal motivational conditions. The battery of tests, as mentioned before, presented a variety of four tests in the form of games: (1) dotting and pricking, (2) crossing vowels (3) writing natural numbers, and separating the odd numbers from the even by distinctive marks and (4) drawing as many figures as possible out of the dots given on a sheet of paper. The aim of the situation test was to estimate persistence, i.e. how long one could stick to a job, however difficult and boring it might be. MacArthur's definition that "persistence is a virtue by which an individual continues in steadfast pursuit of an aim, in spite of difficulties or obstacles" was kept in view.

It is true that the quality of persistence mainly required in the field of education is mixed with intelligence, but at the same time it appears to be true that people need persistence in certain jobs which at the moment are dull. This is particularly so with the beginners in any language or in Arithmetic where repetition seems to be the only way of learning. The tests presented in this investigation were not completely unintelligent activities as each of them demanded understanding of the principle of each game.

The writer made the following assumptions before constructing his test:

(*i*) That persistence was not necessarily related to high intelligence and that there was a special trait called persistence, independent of intelligence.

(*ii*) That less persistent persons change their occupations in a given time more often than the more persistent persons.

Administration and Scoring. The time allowed for administration of the test was thirty minutes. The scoring of this situation test was guided by the above consideration and individual scores were calculated by dividing the total time spent (in this case almost the same, i.e. thirty minutes as the maximum time allowed, few giving up entirely before time) by the number of activities attempted. If an individual stuck to one job for the whole period, he naturally scored more than one who changed two or three times.

The Selection of the Criteria. In a domain such as personality, the selection of a criterion against which to measure the test-results forms one of the crucial steps in an experimental investigation like the present one. But it appears to be impossible to obtain a fully reliable standard by which to judge the result furnished by the tests or questionnaires. There are no dependable criteria upon which objective validation of the measure used might be based.

There are ratings on the one hand and other types of tests on the other. But it is not possible to have absolute assessments of personality aspects like persistence and interest. According to Burt[2] "even a personality is an abstraction, a child is not an isolated unit...what the psychologist has to study are the interactions between a personality and an environment...the behaviour of a dynamic field of which it forms a part." The same attitude is revealed by Murray and others in their proposal for a theory of personality. True it is that no judgment can possibly be regarded as final and as such the question of criterion is very controversial.

Therefore, the writer has considered it advisable to obtain estimates of the degree to which the subject possesses the traits in question, from persons who have had an opportunity of observing him for some time under a variety of conditions. This is, of course, a deliberate step to evade unnecessary debates, and the writer feels justified in doing so. Ratings are according to Vernon, "most inadequate as the sole criteria of a person's traits, or as the sole source of data for the scientific study of personality."[3] The writer is quite conscious of the limitations of ratings. He has, therefore, reasons to look out for other suitable criterion particularly for validation of interest tests.

CRITERION FOR VALIDATION OF TESTS ON INTERESTS

As ratings cannot serve as a very dependable criterion for selection of tests which intend to measure something involving motivation, it was considered wise to select some other criterion for comparing the test results and thereby validating the instruments. For this purpose different groups in different institutions, namely: technical, commercial, art, agricultural, science and academic, showing better performance in successive examinations were selected. If it is observed that the items in the different tests designed to detect particular interest are favourably responded to and a significant correlation be found out between the responses of respective groups and corresponding ratings of judges some evidence of external validity may be obtained. The solution of a criterion group for a more objective validation in the case of interest assessment is not, of course, a very usual procedure.

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[2] Burt, Cyril, "Symposium on Personality", *British Journal of Educational Psychology*, 1945, p. 108.

[3] Vernon, P. E., *Personality Test and Assessment*, p. 102.

The intention of the writer was also to obtain the opinion of some expert judges about the suitability of items in respective fields of interests as criteria for internal validation of tests on interest. Thus the whole list of items was given to each expert for indicating those items which in his opinion indicated the interest in the particular field. For internal validation item analysis has been made as shown in the Appendix. The purpose of the analysis was to find out the consistency of each item with the total score.

CHAPTER EIGHT

Pilot Study

WITH THE theoretical framework, narrated in Chapter 7, in view, it was considered desirable to conduct a Pilot Study before starting the main experiment.

The Pilot Study was expected (*a*) to give the experimenter a definite idea of the various stages of the experiment beforehand so that, the experience gained from the Pilot Study might be of help, in case modification and improvement of the test materials or revision of the testing programme proved necessary, (*b*) to give the experimenter practice in administering the test, particularly in such respects as standardization of emphasis in oral directions. It would also provide information as to (1) the length of time needed for the questionnaires, (2) the reactions of the subjects to the tests, (3) the suitability of the tests to the age, abilities and interests of the boys and girls, and (4) the adequacy of the directions.

In short, the purpose of the Pilot Study was mainly to make necessary revision of the tests and testing programme in the light of the experience gathered. It is worthwhile to mention in this connection that a scheme was drawn up for the sake of convenience under the following arrangement: (*a*) Population, (*b*) Tests and Techniques and their administration and (*c*) Result.

POPULATION

The population selected for the Pilot Study consisted of boys and girls from six different types of institutions, namely (1) Arts School, (2) Technical School, (3) Agricultural Institute, (4) Commercial College, (5) Arts section of general colleges and (6) Science section of general colleges.

A selected population showing interest and better performance in respective branches was taken. The size of the whole population was about 230, and the age range in all the sections was from fourteen to eighteen years. After describing the population as a whole the writer would like to describe the main features of each type of population in each institution selected for the purpose.

Indian College of Arts. The institution is situated in a congested area in central Calcutta. The selected population tested came to 36 including boys and girls mostly from the city.

The battery of tests administered in these institutions comprised questionnaires, situation test and performance sheets for the assessment of interest and persistence.

Jadavpur Polytechnic. The Technical branch of this school was well equipped and a population of 21 only showing keen interest and better performance was selected for the tests. The population was drawn from the neighbouring area and from different social strata, within the age range of 14-17 years.

The test administered in this school comprised the same battery for the assessment of both interest and persistence.

Goenka College of Commerce. This commercial college is a government institution and admits students who have passed the School Final examination. The institution is housed in a spacious building.

In consultation with the principal and the staff of the college, tests were administered on 28 students showing better performances. The students comprised roughly a homogeneous population.

Agricultural School at Behala. This institution is situated at the outskirts of the city of Calcutta in rural surroundings and drew its population from the neighbouring area. The size of the population selected was only 20. It was very difficult to get a larger number of interested students in this section.

General College at Baraset. The sponsored college is located in nice surroundings in a mofussil town. The size of the population who took the test came to 64 and 62 in academic and science section respectively.

The socio-economic standard of the population did not vary to a great extent as most of the students came from the middle class families of the neighbouring area.

In this connection, it is worthwhile to mention that the institution is co-educational and the level of motivation appeared to be uniform.

TESTS AND TECHNIQUES AND THEIR ADMINISTRATION

As mentioned before the tests and techniques adopted in this study, consisting of questionnaires, paper and pencil tests and situational tests, were the same in every institution. Besides the tests, teachers' ratings on three-point scale were taken for comparison in cases of doubt.

Administration of Tests. The tests were applied in different institutions in co-operation with the members of the staff. The battery of tests took about one hour for effective application. In each case oral instructions were also given and an attempt was made to keep up the test-situation almost uniform. As regards the teachers' ratings, three teachers were personally approached for submitting agreed rating of boys and girls on interest and persistence. Necessary instructions were given to each rater on a typed sheet of paper and each was asked to base his individual opinion of pupils on objective analysis of behaviour patterns. Every trait was defined and the rating scale was described. (Vide copy of the instructions sheet appended.)

RESULT OF THE PILOT STUDY

As mentioned earlier, the purpose of the Pilot Study was to find out the suitability of the tests as well as to gain some experience for future guidance. As regards the reliability of the tests, the figures are given in Table 3A. So far as the validation of the persistence test is concerned the battery was found to correlate up to an extent of .69 with the teachers' agreed ratings. But teachers rating did not appear to be a very good criterion against interest-test score as the correlation between the two was very poor. The teachers admitted of the limitations under which they had to work and referred to the narrow school situation where the students had very little opportunity to show their interest. That is why another criterion group was selected for this purpose. Results of the item analysis are given in Table 2C.

CHAPTER NINE

Revision of Tests

REVISION of the tests and techniques was one of the purposes of the Pilot Study. So, in order to make necessary revisions of the tests and techniques it was decided to validate each and every test item against certain criterion. After validation was completed, various test items of each sub-test had to be modified or revised. As will be observed from the battery of the test given in Appendix there are four sub-tests comprising the battery of test designed to assess interest. Similarly there are three sub-tests comprising the battery for the assessment of persistence. Generally, however, the sub-tests were regarded as individual test and each test was administrated separately, but it was felt that separate administration of tests demands a longer period. It was, therefore, considered desirable to include each individual test under one battery as sub-test. Thus, this modification, in the general structure of the test proved more convenient both for the experimenter and for the subjects. With this modification the time of interval between administrations of tests was reduced, in spite of providing the subjects separate time limit for answering tests one after another. The whole test battery was supplied to them with proper direction. This enabled the experimenter to economize time and energy.

Revision of Sub-test No. 1. Originally, there were eighty-four items in the questionnaire form, but it was later on found that the items did not stand the acid test of validation against the criteria. Necessarily some items where the validity-values were insignificant, had to be dropped and some had to be modified. It was also observed that the opinions of the expert did not prove very favourable for retention of these items. In some cases, of course, there was confusion as they appeared to be very promising, but the result of the Pilot Study would not justify their retention. There were some, however, which had the making of good items, but due to defective wording they could not serve the purpose. Naturally, they were modified to a certain extent in the light of the opinions of the experts and the experience derived from the Pilot Study. The details of item analysis are given in the Appendix [Table 2C (i)—2C (vi)]

Many underwent revisions and their explanations are given below: (The original as well as the modified versions of tests are given in the Appendix).

Item No. 12. "Will you like to read Botany in a holiday?"—did not prove very suitable for the purpose of discriminating the choice of the student at this stage. It appeared that the subject Botany in many cases was beyond the range of their experience and as such most of them were indifferent to this item. Naturally, the necessity for revising the item was felt and the question was rephrased on a wider basis.

Item No. 21. The question appeared to provide a very narrow scope for responses and the response demanded was not very normal. As it was considered desirable to make it broad-based and less superficial the question was revised.

Item No. 22. This item was revised because of its poor validity value (vide item analysis). The question was made more general by rephrasing.

Item No. 29. The item needed revision because "repairing a torch-light" is a specific job. The weakness of the item also was revealed from the analysis of the responses. So it was rephrased.

Item No. 72. "Do you find the history of civilization interesting?" was revised as "Will you read world literature when you find some leisure time ?" The rephrasing was necessary as the concept of world civilization did not appear to appeal to the minds of the youngsters. The revision, therefore, was expected to be more effective.

The following items underwent certain slight modifications and the explanations are given below.

Item No. 16. The item was modified in consideration of the poor validity value (vide item analysis). It was also felt that the interest in agriculture may be manifest at different levels. So, the item was rephrased.

Item No. 19. The situation in which the information was demanded was a bit unusual one and as such the question did not prove very effective. The item needed further modification. This was, therefore, modified with a view to making the situation more comprehensive.

Item No. 46. The item appeared to be overlapping with Item No. 2 and it was felt desirable to put the question in a modified form. Thus the question was rephrased in the form: "Would you spend most of your time on books on science?"

Item No. 49. This was modified as it appeared that artistic interest was indicated more by drawing a picture. The item was modified also because of low discriminating value.

Item No. 52. This item was originally designed to assess academic interest but it was later on found on analysis that this did not prove very suitable for the purpose. On the other hand, the item had a very significant discriminating value for the purpose of assessing artistic interest. It appeared that poems pertain more to fine arts than to academic field. This assumption finds its support from the figures in the item analysis.

Item No. 75. This item was originally designed to assess academic interest but the poor validity value proved its weakness. Naturally it was discarded but further analysis revealed that the item can be used for assessing commercial interest. It was, therefore, slightly modified in order to make it more suitable for the purpose, as follows: "Do you like to have classes on Commercial Geography more than those on other subjects?"

Revision of Sub-test No. 2. This sub-test was constructed with the expectations that it would indirectly serve the purpose of assessing interest. Thirty-six test items were originally constructed for drawing information in different fields of interest. It was hoped that one who keeps relevant information in a particular field, was more interested in the same than in other. With this assumption this sub-test was tried and the result of the Pilot Study proved satisfactory. Out of the thirty-six items only twenty-four could be retained and that also after minor modifications. One of the main reasons for limitation showed by the test was different socio-economic environment in which the pupils lived. There were certain items which could not prove very effective in discriminating the degree of interest shown in the respective field.

It was naturally very difficult to justify the retention of some of these items which did not show much promise. It was also felt that there was good deal of overlapping between one field of interest and the other. For example, the experimenter faced great difficulty in drawing a line of demarcation between the technical and science courses, as both of these had a number of common features.

The test items which have been left out appeared to be promising in some cases, but in fact they did not prove very effective (as shown in the analysis).

Construction and Revision of Sub-test No. 3. This sub-test originally consisted of thirty items arranged in six groups. It was a situational test demanding the preference of one activity out of two or three. Originally the subject was asked to select one of the three items, but it was noticed after analysis that in some cases there was a tendency to show one's preference to the items presented in the middle of the page. In other words, they appeared to be influenced by the location of the items which attracted their attention more easily. After the items were validated against the criterion, it was observed that as many as twelve items found no support from the statistical findings. There were certain items which appeared to be very relevant for the purpose, but they showed little significance in actual practice. The experts' opinions were also taken into consideration and there were some confusions on the retention of these items. In some cases, the experts were of opinion that the items suffered from limitation of inaccurate presentation or vagueness. It was, therefore, considered desirable to try these items again after necessary improvement in the quality of presentation. In the main experiment, therefore, the number of items was ultimately reduced to eighteen and grouping had to be altered. (Both the original and the revised forms are given in the Appendix.)

Revision of Sub-test No. 4. This sub-test originally consisted of thirty items arranged in twenty groups, each group originally consisting of three items. 'It was a situational type of test demanding the preference of one item out of three. The items were in the forms of different types of news. It was expected that one would show his preference to certain news if he was interested in that field. As in the case of Sub-test No. 3 it appeared also in this case that the location of the items was influencing the choice of the subjects. So, it was decided to alter the arrangement and two instead of three items were placed in each presentation in order to check one's tendency towards the middle. The item analysis showed that a number of items did not prove very effective, though they were apparently promising. The result indicated that there was some confusion in the mind of the subjects and some of the items designed to measure one type of interest had actually evoked inconsistent responses. In the case of such items the experimenter had to analyse the causes of failure of the items to measure the specific interest and in most cases he could find out the limitations of each item, with the help of experts. Ultimately four out of five items comprising each field of interest could be retained even after slight modifications. Necessary improvement in the quality of the items regarding clarity and precision was effected. For example, in some cases the headline of certain news items did give a different impression from what was intended by the main body of the news.

Revision of the Questionnaire for the Assessment of Persistence. The questionnaire originally consisted of eighteen items. As the term "persistence" may have different meanings, it was considered desirable to construct all the items with the following concept in mind. For discriminating between those who were steadfast and who quickly got bored, questions like "Do you feel unhappy if you have to leave a job unfinished?" were asked. In order to have a check on each answer, another question was asked in a different way. For example, as a check against this item the question appeared in a different form after an interval of a few items as "Do you usually go back to a piece of work which you could not finish due to any reason?"

In certain cases item analysis had shown the weakness and those were modified or replaced. For example, the item "Do you take up work one after another for completing instead of taking up too many works at a time?" did not prove very significant as revealed in the item analysis. It appeared to be a very good item, but in actual practice this was misunderstood by a number of pupils. The reason for its failure was perhaps the lack of clarity leading to different interpretations by different people. It was, therefore, decided to discard this item altogether. Similarly, in Item No. 6, namely, "Do you usually go back to a piece of work which you could not finish for any reason?" appeared to be promising, but it had an insignificant validity value. As such this item was also dropped.

Thus out of eighteen items originally comprising the questionnaire for assessment of persistence, two were completely discarded and sixteen were retained after slight modifications in some cases. As regards the revision of the questionnaire No. 2 for measuring persistence, the items originally included were retained because of their statistical significance (vide item analysis of questionnaire No. 2).

Revision of Situational Test for the Assessment of Persistence. As mentioned before, this test was designed to draw out information of the pupils' actual response in a concrete situation. Originally this test included four different types of activities. The students were asked to stick to any type of job as long as they liked, but this sort of allowance gave rise to many practical difficulties of administration. In view of the limited time at the disposal of the experimenter, it was considered more advisable to allow the subjects a limited time of half an hour for participation in any particular activity according to their choice. Though the period was short, there was a good deal of fluctuation observed among the pupils even in that limited hour. So the purpose was served within a definite time limit. In this case the revision was significant in respect of administration.

CHAPTER TEN

The Experiment

AFTER the Pilot Study was over and necessary revision of the tests was made it appeared to be desirable that a preliminary survey of the population for conducting the main experiment should be made. As the construction and the validation of tests and techniques for assessment of interest and persistence formed the major part of the work, the experimenter had to be less ambitious about the size of the population. It was, therefore, decided to take representative sampling as far as possible.

The following points were kept in view while selecting the population:

(*a*) Every area, namely cultural, industrial, rural, commercial and urban may be represented.
(*b*) Every stream, namely fine arts, technical, commercial, agriculture, humanities and science may be covered in equal proportion.
(*c*) Both the sexes and different socio-economic strata may be represented.
(*d*) Age range of the population may fall between fourteen and sixteen.

The writer had originally thought of taking random sampling almost from every district of West Bengal, but owing to practical difficulties he had to remain satisfied with a few. The thirty schools selected were from different areas (vide Appendix).

In this connection, it is to be mentioned that it was extremely difficult on the part of the writer to find out adequate number of pupils taking fine arts as elective subject. Of the total thirty schools ten were situated in Calcutta area. Schools representing different cultural sectors were taken for the main experiment. (Table).

For the sake of convenience, the experiment was classified under the following headings:

1. Preliminary procedure
2. Population
3. Test and Techniques and their Administration
4. Result

PRELIMINARY PROCEDURE

It was necessary in this experiment to observe economy in respect of time, as the time at the disposal of the experimenter was very limited. So instead of allowing unlimited scope for extension of the testing programme the time limit for the administration of certain tests had to be restricted. Besides, the directions and procedures were standardized, in order to ensure economy and precision of time. It was also considered desirable to get in touch with the respective heads of the institutions and to seek all the information that was relevant. Fortunately most of them took an interest in the investigation and co-operated in every possible way. In particular, their suggestions regarding the selection of teachers who might be depended upon for the responsible task of rating, proved very valuable. In accordance with their suggestions the investigator approached the different teachers who had greater chance of knowing the pupils more intimately. They were very much interested in this investigation and helped immensely by their sincere efforts to rate the pupils according to the given instructions. The purpose of the investigation was kept concealed from the pupils.

POPULATION

Sociologically speaking, the whole population could be classified under the following categories: (1) Urban, (2) Industrial, (3) Cultural, (4) Commercial, (5) Rural or Agricultural.

(1) *Urban*: A great number of schools selected for the experiment may be classified under this category. They were twelve in number. The striking features of such institutions were as follows:

(*a*) The schools were not situated in a calm and ideal environment.
(*b*) The population was not purely homogeneous as pupils came from families of different socio-economic status.
(*c*) Some of them came from a long distance as they lived outside the urban area.
(*d*) The external factors influencing their attainments were great in number.
(*f*) In some schools representing the areas the standard of teaching varied to a great extent.

(2) *Industrial.* The number of such schools was very limited (five). Such institutions had some features common to the Category No. 1. One of the striking features of the schools under this category is the distracting situation. The occupation of most of the guardians appeared to be influenced by the demand of the area and local economic condition. It

was felt by the experimenter that in a great number of cases the pupils had no room for study. But in spite of the differences in the standard of living and economic conditions there was some homogeneity in respect of family environment.

The schools representing each area are given in the Appendix with the number of pupils and their scores.

(3) *Cultural.* There were six schools which may be described as representing cultural area. Some of the features of such institutions are: The population of such area was more homogeneous and uniformly scattered. The physical environment of the schools was more or less congenial as there were less distractions in the area. The structure of the family from which the population came was more composite in nature. The general occupation of the members of the family was service, and the standard of living was average. There was at least one under-graduate in each family.

(4) *Commercial.* There was no such typical area as commercial, though some parts of the towns in which the schools were situated were business centres. Naturally, a number of families from which the students came was dependent upon business. Some of them, however, work on salary basis in different shops and business organizations. The population was, therefore, not very homogeneous so far as the occupation, the socio-economic status and family structure were concerned. The surroundings of most of the schools representing such area were in general, very distracting.

(5) *Rural or Agricultural.* Schools representing this area had a scattered population drawn from a wide area. The number of students taking up agriculture as a subject appeared to be influenced by the occupation of their parents. The environment, though soothing, provided limited opportunity for widening one's experience and general knowledge. There was a thin population in such areas and some of the families had to depend mainly upon manual jobs and petty business. As such the homogeneity was not so remarkable, in certain cases.

TESTS AND TECHNIQUES AND THEIR ADMINISTRATION

The techniques are classified as: (1) methods of impression, (2) objective tests, (3) methods of expression (projective techniques), (4) methods of introspection, (5) synthesizing personality sketch (case study).

This is not the proper place to deal with each of the methods in detail. So, particular emphasis will be laid on those which were employed in this investigation. There is hardly any method which is fully reliable for personality study.

As in Pilot Study the tests and techniques employed in the main experiment remained almost the same, though some modifications had to be effected in the light of the experience derived from the Pilot Study. The modifications or revisions made were minor and the techniques applied in the main experiment consisted of questionnaires, situation tests and ratings both for the assessment of interest and persistence. Instead of describing schoolwise the testing programme on each individual occasion, the situation in general will only be outlined and the change in procedure, if any, mentioned. For example, in few schools an intelligence test (Otis Self-Administering Test), besides the tests and techniques, used in common, was also applied. This was done with a view to studying the interrelation between intelligence, interest and persistence in a casual way. It was, at the same time, interesting to collect data of the occupations of the parents of the children taking the tests, for analysis and interrelation.

So far as the administration of the situation tests for the assessment of persistence is concerned, it is important to note that the subjects were made to understand that they could stick to the same job throughout the entire period. Thus a fixed time limit was given.

According to Notcutt, "It is sometimes possible to present a task as a measure of ability, and then to use the results for measuring other qualities"[1]. This was followed in practice, and the mention of speed was expected to encourage them to be active throughout their attempts. Otherwise they might have gone at a leisurely pace instead of concentrating and spending their energy on the particular job in hand. This also helped the experimenter to keep up the level of motivation fairly steady. But after some time a few appeared to be bored with their task and preferred to attempt a different activity. All of them appeared to be well motivated. It was also interesting to notice that after the lapse of a fair length of time some preferred to stop and take a rest after recording the time. Fortunately enough, such cases were very rare and thus the writer could score without any further complication of the scoring principle.

It is obvious that even in this test, the experimenter had to depend upon the honesty of the boys so far as their intensity of work was concerned. But thorough supervision minimized the possibilities of dishonesty.

RESULTS

As mentioned before, students from different schools were tested. The test-results require some arrangement and will be presented in the next chapter.

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[1] Notcutt, B., *The Psychology of Personality*, 1953, p. 49.

CHAPTER ELEVEN

Collection of Data

As MENTIONED before, students from thirty schools representing different areas of West Bengal were tested. In all the institutions the procedure and technique remained almost uniform. The administration of the tests in spite of gradual improvements owing to more and more experience, remained almost the same throughout.

The data obtained from each experiment require some arrangements and analysis. It was therefore, considered preferable in the first instant to present them school by school.

Tables 1 to 6 in Appendix I, present the data collected from the experiments. They show the range, standard deviations and figures of correlation of the final scores obtained on the measures. From an inspection of the tables, the range of the final scores reveals several outstanding features.

Most of the persistence and interest measures obtained by the questionnaire and other techniques show a wide range of distribution.

The ranges of (both the persistence and interest) scores do not generally vary to any large extent from experiment to experiment, i.e. from school to school. This is an indirect evidence of the suitability of the test for the whole range of population selected. The next step is to discuss the result obtained in each investigation. Table 1A shows the data obtained including the range of scores, standard deviations, etc., derived from each subtest of the persistence test battery. Table 1C shows the range of the ratings scores of individual teachers and Table 1B shows the range of the total scores of the whole persistence test battery. Table 1D shows the range and standard deviation of interest test scores obtained in Pilot Study and Table 1E presents range and standard deviation of the interest scores obtained in the main experiment. After obtaining the interest scores from the Pilot Study all the items were analysed by upper *v.* lower techniques before the reliability was found out. Table 2A presents the difficulty and validity values of each item of questionnaire (1) and Table 2B presents the item analysis of questionnaire (2), for the assessment of persistence. Two items (items No. 5 and 11) have been dropped out from questionnaire (1) because of their low validity values.

In questionnaire (2) all the items have been retained because they showed satisfactory difficulty and validity values. So far as item analysis of interest test is concerned the chisquare values as well as difficulty and validity values have been determined for external and internal validation and shown in Tables 2C, 2D, 2E and 2F. After the item analysis was complete the reliability of the tests was found out and the figures are given in Tables 3A, 3B, 3C and 3E. Besides, the interrelation between the different subtests is shown in Table 4.

The distribution of interest scores in respect of individual institutions and the distribution of all the persistence scores have been shown in the Appendix. Besides the inter-correlations between individual sub-test and the whole test battery (minus the particular sub-test) are shown in Table 5.

Table 6 presents schoolwise the inter-correlations, together with the partial correlations between interest, persistence and school-attainments.

CHAPTER TWELVE

Interpretation of the Data

AFTER the tests were administered, scored and the result collected, the next step was to portray the frequency distribution in graphical form, in order that their characteristics might be determined more easily.[1]

One of the simplest forms of graph was chosen for this purpose namely, the frequency polygon. Distributions of scores corresponding to each test are shown in graphical forms. Adjacent to each frequency polygon is a statement of the mean "M", and the standard deviation. The actual form of distribution is determined not only by the nature of the test itself, but by the population tested and by the conditions under which the test was administered.[2] In the present investigation the tests were administered very carefully under the supervision of experts and every effort was made to maintain uniformity in test situation.

Turning to the frequency polygon, it was found that in no case did a distribution stray sufficiently from the essentially symmetrical and "normal" curve.

VALIDATION OF THE TEST

Validation of the instruments which were designed to assess both interest and persistence is rather difficult. It involved the crucial problem of determining what the tests actually measure. So the discovery of a dependable criterion for validation appeared to be essential. It was, therefore, considered advisable to take a criterion group for comparison and analysis. As will appear from the tables showing the chisquare values and item analysis, most of the items were found effective and valid. The internal validation was mainly attempted by item analysis which is a helpful technique in the field of assessment.

In the Pilot Study, the interest tests were validated and the following result was obtained. Out of eighty-four items in the sub-test (1) sixty could be retained and twenty-four discarded because of lower chisquare values obtained from the analysis. The data could be arranged in a 2×2 table as shown below:

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[1] Lindquist, E. F., *A First Course in Statistics.*

[2] Garrett, H. E., *Statistics in Psychology*, 1947, p. 194. Longmans Green & Co.

Variable No. 1		Variable II		
		Tech.	Non-Tech	Both
	Favourable	a	b	$a + b$
	Unfavourable	c	d	$c + d$
		$a + c$	$b + d$	

The null hypothesis was formulated as it was assured that the samples were randomly drawn and differ only by accident of sampling. In other words, the hypothesis asserts that no true difference exists between two samples (technical, non-technical, etc.). It was tested by the formula:

$$\frac{N\ (ad-bc)^2}{(a+b)\ (a+c)\ (b+d)\ (c+d)}$$

Similarly, out of thirty-six items in sub-test (2) only twenty-four could be retained and twelve discarded because of the poor validity values. In the case of sub-test (3) only eighteen out of thirty could be retained. In sub-test (4) out of thirty some have been discarded and the rest retained. So far as items for the assessment of persistence are concerned, sixteen out of eighteen items comprising the questionnaire (1) have been finally retained and the rest discarded. The other two sub-tests for assessing persistence, though different in nature, served a very useful purpose and the items in both the cases appeared to have some psychological significance though a few of them had to undergo slight modifications.

As regards the next step, i.e. the method of finding the reliability there still exists a lot of controversy. Advocating the split-half method, Anastasi remarks, "the effects of variation in the subject, during even the shortest period of the test tend to be equalised by the temporal arrangement of odd and even items"[3]. This method seems, therefore, to give most nearly the reliability of the measuring instrument, free from extraneous change. In spite of this support for the split-half method the test-retest method has its merits. It is important then—to use a measure of reliability which shows the test consistency despite a change in the external and internal influences operating upon the testees. This can be achieved by the test-retest method. Thus each of the methods appears to have its use. In the case of persistence tests, both the techniques were used and the writer got the opportunity of applying almost the same test twice to the same population meant for the Pilot Study.

[3] Bringham, W. V., *Aptitudes and Aptitude-Testing*, 1937, pp. 28-9.

The coefficient obtained by the test-retest method, which requires two administrations of the tests could have a greater reliability coefficient than the values obtained by the single application tests. It enables one to decide whether reliance for prognostic purposes can be placed on a test or not. Cronbach[4] says, "the concept of reliability is meaningless unless one postulates that two measures of the same function exist. They may be successive measurements of a stable event or simultaneous measurement of a unique event. One of the important factors affecting this coefficient is the length of the interval between the two trials. The longer the length of the interval the greater the degree of confidence that can be felt in the use of a test in the educational and vocational guidance work. This is why an interval of more than six months was kept between the two occasions of administration. Kelley[5] suggests that when a test is to be used for group assessment purposes, a reliability coefficient of .50 or high is required. Examined in the light of this standard all the tests on persistence and interest are suitable for group assessment.

From Tables 3A, 3B and 3C, it will be seen that both the split-half and the test-retest reliabilities were satisfactory throughout the experiments.

As regards the problem of validation, the modern tendency is to find out the internal consistency of test by means of factor analysis. But there is also the difficulty that an infinite number of solutions exists to one factorial problem. It is, therefore, not our present purpose to embark on factor analysis, but to attempt validation by discovering the correlation between the different sub-tests and some suitable criteria. As regards the teachers' ratings, it is worthwhile to mention that in the former case of interest assessment they are not very dependable as there were wide variations. So, the idea of taking teachers' estimates on interest had to be ultimately dropped. But so far as ratings on persistence are concerned, there has been found a significant correlation between the composite score of persistence and the agreed teachers' estimates (Table). The reason for the lower correlation in the former case may be attributed to the fact that the school situation is too narrow to permit a systematic observation of the different types of interest mentioned before.

Besides the problems of construction and validation of test, the main issue was to find out the interrelation between interest, persistence and attainments for prognostic purpose. But the writer had to face a crisis owing to the fact that no standardized attainment test was available in all subject areas. It was not possible to construct and standardize such test, as the main purpose was different. He had, therefore, to abandon the idea of applying the same type of test to every institution, and the circumstances compelled him to proceed with the experiment school by school to avoid criticism on account of subjectivity and variation in the standard of examination. Thus the data treated were schoolwise at the cost of the pooling effect of the composite whole.

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[4] Cronbach, L. J., "Test Reliability--Its Meaning and Determination" *Psychometrike,* Vol. 12, 1947, p. 6.

[5] Bloom, B. S., "Test Reliability for What". *Journal of Educational Psychology* Vol. 33, 1942, p. 517.

The writer was also conscious of the limitation due to the fact that he had to depend upon the examination result in each school for want of standardized tests in different subjects, but this was partly removed by taking the average of more than one set of marks in different class examinations in respective subject areas. For a close study of the data, it would be wise to discuss them one by one. In this connection it may be mentioned that standardization of result of internal examinations was an outstanding problem; scaling estimates of teachers in different schools might partly solve the problem, but this idea was dropped when the teachers expressed their difficulties in the existing school situation. Nor were there any common tests related to different fields of study. The rank correlation instead of product moment correlation was therefore found out because of the limited size of the population in each school.

From Table 1A it is obvious that the range of individual sub-tests of persistence is satisfactory. Besides, the reliability co-efficient of the whole test battery which is shown in Table 1B is significant.

From Table 1C it will be seen that there is a wide variation between the different sets of rating scores taken on different occasions, and it was, therefore, decided to take the agreed estimates of all the ratings.

In the pilot study the ranges of the interest scores (Table 1D) show an interesting variation. In all the multilateral institutions where the main experiment was conducted, the mean score was found to be usually higher in the particular field of interest and the range was wider than that in other fields. This statistical significance of this difference was also found out. If a given mean difference was three times its standard error it is to be considered significant. The critical ratios in all the cases have been found to be more than three and hence it is certain that the mean differences are too great to be ascribable to chance factors.

Table 1E gives a picture of the population, range of scores with standard deviations. It is apparent from the Table that in certain schools where the tests were administered on smaller number of students the range of scores has tended to be narrower and the normal distribution of the scores has been mostly affected. The scores however when taken together and graphically presented show a normal distribution.

From Table 2A—showing the detailed item analysis of all the persistence items—it can be seen that Items No. 5 and 11 were proved weaker because of very low validity values and have, therefore, been dropped.

From Table 2C—showing item analysis of interest of test item—it can be seen that a number of items has been dropped or modified. The items where chisquare value is not significant at .01 level have been either modified or dropped.

Table 3A shows both the split-half and test-retest reliability of the persistence Sub-test No. 1. It is observed that the figures are highly significant and the split-half reliability is slightly lower than the test-retest reliability.

From Tables 3B and 3C the reliability figures of questionaire 2 and situation test are found to be rather low. This is perhaps due to the small number of test items contained in each of the test.

Table 3D presents a very interesting picture showing the test-retest reliability of the tests for assessing interest in respective fields. It is observed that the test items designed to assess fine arts have reliability co-efficient higher than others.

Besides, the inter-correlations between the different sub-tests of persistence and interest have also been shown in Tables 4A and 4B. Similarly, the interrelations between the sub-tests and the whole tests on persistence and interest have been shown in Tables 5A and 5B. It can be seen that in all cases the correlations between individual sub-test and the whole test battery minus the particular test is satisfactory.

From Table 5 it is obvious that in all cases the partial correlation between interest and attainments is higher than that between persistence and attainment. It becomes necessary now to adopt some method of determining the significance or otherwise of a correlation co-efficient. The standard error of a co-efficient correlation depends upon the size of the obtained "r" and on the size of the sample "N". The size of the sample being small here, the calculation of the standard error ot the co-efficient correlation is made on the basis of the formula.

But the significance of an obtained "r" may be more accurately tested against the "Null Hypothesis" than in terms of "Pgr." The methods of testing the significance of "r" when "N" is 50 or less are given by Fisher.[6] (Table 5A).

Besides, the correlation between interest and persistence is positive (viz. 22), though not high. In this case the whole data could be statistically treated because both the tests on interest and persistence were common in every school. It was also observed in general that the total persistence and interest scores give a higher multiple correlation with attainments in respective fields than between individual test scores. This was calculated according to Thomson's Estimation of Pooling Square.[7]

It was also casually observed that the interest had very little bearing on the socio-economic environment in which the child lived and this was indicated by the poor correlation between two sets of scores. The writer

[6] Fisher, R. A., *Statistical Methods for Research Workers*, Oliver and Boyd, 1950, p. 209.

[7] Thomson, G., *The Factorial Analysis of Human Ability*, pp. 198-9.

also applied an ad hoc intelligence test (adopted from Otis "Self-Administrating Test) in certain schools only incidentally for the sake of comparison. It was found that there was some positive correlation between intelligence test and interest score. But the correlation between the former and attainments was rather insignificant.

CHAPTER THIRTEEN

Conclusion

AS MENTIONED before, the aim of the present investigation was to study the inter-correlation between interest, persistence and attainment of secondary school boys with a view to finding out a scientific basis for educational guidance. It was really an arduous task to objectively assess the different aspects in question, namely persistence, interest and attainments, as no suitable test for this purpose could be made available in this country. The writer had, therefore, to devote a considerable time and energy for constructing suitable tests for the assessment of both interest and persistence. The techniques for assessment were varied because attempt was made to assess the traits in question in their various aspects and the problem of assessment was attacked from different angles. The construction of the tests formed the major part of this work. Their validation demanded a longer time and an exhaustive statistical procedure as the tests had to pass through different stages of validation. After the reliability and validity were found out, the writer had to proceed further for the study of inter-correlation. But the question of reliability and validity is an embarrassing one. No test can have validity unless it has a good reliability.

On inspecting the tables of reliability co-efficients it is observed that both the tests have reliability co-efficient quite satisfactory and significant. Besides, the significant inter-correlations between different sub-tests (Tables 4 and 5) further prove the reliability of the test. As regards the more important problem of validation the modern tendency is to find out the internal consistency of test by means of factor analysis. As Vernon says, "By statistical treatment of correlation between personality test or ratings it is possible to determine the common element or factor, in the same way that G is extracted from intelligence test." According to him, there is also the difficulty that an infinite number of solutions exists to any factorial problem. It is, therefore, not the present purpose to embark on factor analysis, but to attempt validation by discovering the correlation with the criteria. As a check on the internal validity item validation was carried out and the next step was to try the other approach though not usual.

As regards the assessment of interest, different sub-tests were constructed so as to comprise the test battery, and besides internal validation by item analysis the test was validated against the external criterion, namely the responses of the criterion group. The discriminating value of each item was thus examined by finding out the statistical significance of the difference in responses by chisquare test. Thus the interest test had undergone a number of stages of validation.

So far as the assessment of persistence is concerned three different tests were constructed for the purpose. The questionnaire formed the main technique. Validation was sought mainly through item analysis, though attempt was also made to compare it against the external criterion, namely the agreed ratings obtained from the teachers. It has been found that the correlation between the persistence test and teachers' agreed ratings was 69. But as the present criterion could not be claimed to be infallible, it appeared worthwhile to see how the test score stood after comparison with certain other checks, namely questionnaire (2) and situation test. It is to be mentioned in this connection that reliability of situation test was at the same time reasonably good. In only one case the reliability was poor and this was questionnaire (2). The correlation between questionnaire 1 and questionnaire 2 was poorer and that between questionnaire 1 and situation test was not so low (Table 4A). Thus the test (questionnaire) is not only found to correlate fairly with the external criterion but at the same time the inter-correlation between different sub-tests was in general satisfactory.

The different correlation tables show the validity of the tests to an appreciable extent. The writer also studied the correlation between different tests scores. Here, he had also been confronted with the difficulty regarding the school marks in the different areas as he could not get any dependable objective test on different subjects pertaining to different streams. As such, he had to depend upon school examination, the standard of which varies to a considerable extent. Therefore, he had no other alternative but to proceed with his experiment school by school. It was a great handicap, no doubt, as the total data could not be statistically treated for finding out the inter-correlation, owing to the difficulty narrated above. For each school, therefore, a separate table showing correlation between persistence, interest and attainment has been prepared. It has been, however, possible to treat the total data for finding out the inter-correlation between the factors, except attainment. On an analysis of the correlation tables it will be evident that the correlation between interest and attainment is in no case less than .57 and that between persistence and attainment is in no case less than .47. It shows that the correlations are satisfactory in each case but instead of depending upon the individual correlation figures the writer tried to eliminate the influences of the other variable by means of partial correlation. Since the attainment scores depend both upon interest and persistence, the individual correlations between sets of scores may be influenced by the common relationship to the variables. It is thus necessary to discover the actual relationship between attainment and the individual traits and to rule out or control the other external factor. For example, in this case, persistence may have a very significant influence upon inter-correlations between interest and attainments and in order to control this external factor it might be possible to carry on the experiment by selecting children all of whom are of the same persistence. But this procedure offers many difficulties, the principal one being that it is well nigh impossible to find a large sample of children of exactly the same persistence. In fact, the experimental control of this variable method of selection would so limit the size of the group that the correlation will be of doubtful values. Because of these difficulties the method of partial correlation has been employed and thus the relationships between the variables have been determined by keeping one or more related variables constant. Thus the partial correlation between interest and school achievements gives us the correlation between the two variables uninfluenced by the factor of persistence. Such a partial co-efficient represents the net correlation between interest and attainment when persistence is a general factor. The figures showing the partial correlation between different variables are given in the Appendix, school by school. It also appears that the lowest partial correlations arrived at in a particular case have some statistical significance calculated by the formula:

$$\frac{t=r/\ N-2}{/\ 1-r^2}$$

On a critical analysis, therefore, the tests on interest and persistence prove to have been fairly reliable and valid. Secondly, the correlation between interest and attainment is just statistically significant, though that between persistence and attainment and persistence and interest is rather low and not very indicative.

So it is desirable to find out whether the weighted total of the interest and persistence scores gives a significant multiple correlation with the attainments. The estimation and the pooling square might have served this purpose. In this case there are (1) Interest test scores and (2) Persistence test scores to be compared against school attainment. The following is the table showing the inter-correlation between the different scores.

	Att	*Int.*	*Pers.*
Attainment	1	.56	.4
Interest	.56	1	.42
Persistence	.41	.42	.1

As we want to know whether a weighted sum of *TR* and *ST* will give an appreciably higher combined correlation with questionnaire (1) it is better to arrange them in the following manner (according to the method suggested by Godfrey Thomson[1]). The matrix of correlation with the criterion column deleted being:

$$\begin{matrix} .56 & .41 \\ 1 & .42 \\ .42 & 1 \end{matrix}$$

The weight for Y is, therefore, proportional to:

$$\begin{matrix} .56 & .41 \\ .42 & 1 = .4678 \end{matrix}$$

and that for Z is proportional to:

$$\begin{matrix} .56 & 41 = .1748 \\ 1 & .42 \end{matrix}$$

and the minor left is:

$$\begin{matrix} 1 & .42 = 8232 \\ .42 & 1 = .64 \end{matrix}$$

or by dividing each weight by .64 we get:

$$\frac{.4678}{.8232} Y + \frac{.1748}{.8232} Z$$

or $$.568 Y + .212 Z$$

Now the result of multiplying the Y column by .568 and the Z column by .212 is the following:

$$\left| \begin{array}{cccc} & .568 & & .212 \\ \hline .568 & 1.0 & .56 & .41 \\ \hline & .56 & 1.0 & .42 \\ .212 & .41 & .42 & 1 \end{array} \right| = \left| \begin{array}{ccc} 1.000 & .318 & .086 \\ \hline .318 & .322 & .0501 \\ .086 & .0501 & .044 \end{array} \right.$$

$$= \frac{1.000}{.404} \left| \frac{.404}{.404} \right.$$

$$\text{Multiple Correlation} = \frac{.404}{-404} = .63$$

Thus the weighted sum of interest and persistence gives an appreciably higher combined correlation with attainments.

Besides the different correlation tables show the validity of the test to an appreciable extent.

After the first part covering the major work was complete the writer studied the correlation between different test scores. Here, he had also been confronted with the difficulty regarding the school marks in the different areas as he could not get any dependable objective test on different subjects pertaining to different streams. As such he had to depend upon school examination, the standard of which varies to a considerable extent.

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[1] Thomson, G., *The Factorial Analysis of Human Ability.*

FURTHER SCOPE OF RESEARCH

The problem of isolating certain traits is difficult and there appears to be a considerable amount of overlapping in the sphere of personality. The present investigation was like many others founded upon certain basic assumptions and there is scope for further verification in this line.

While attempting the study of interrelations between interest persistence and attainments it was felt that there are many factors influencing attainments. There is a scope for further study of interrelation between different factors appearing to be related to such school attainments. Besides the psychological factors, there are many sociological conditions having bearing on attainments. It is, no doubt, extremely difficult to control these variables but there exists a scope for research on the influence of such sociological factors.

The writer was at first too ambitious to find out the different correlates of success for a curricular guidance, but later on it appeared that the construction and validation of suitable instruments demand a long time. Besides, standardization of such tests is another time-consuming process, though this is very important for more effective use of the tests. There is scope for standardization of such tests and their extension in vocational fields.

Unless an objective basis of guidance is discovered, the allocation of the diversified courses would be different. With the purpose of throwing some light on the unexplored field of guidance, the writer has tried to find certain correlates of success in different subject areas. There is undoubtedly scope for more fruitful research in this line and in the opinion of the writer the day is not far when allocation will be mainly determined by special consideration of the personality traits.

Part III

PRACTICAL ASPECTS OF GUIDANCE

CHAPTER FOURTEEN

Techniques of Data Collection for Guidance

INTERESTS AND ITS IMPORTANCE IN THE GUIDANCE PROGRAMME

INTERESTS, whether expressed, tested or inventoried, contribute to the guidance programme. They are undoubtedly the most important motivating factors leading to satisfactory progress in any field of activity. It should not, however, be assumed that a person can never attain success in an area of experience without interests. There may be other stronger considerations, namely financial security, social prestige, etc., which may help a person to apply himself to the task. But generally, one's interest offers the best clue for finding out one's motivation. It has also been experienced that interest ensures achievement if it is combined with aptitude, but interest without aptitude sometimes leads to frustration. It is perhaps true that aptitude involves some skill or ability which depends much upon one's environmental opportunity. Thus there is a chance of doing injustice to the rural people while considering their fitness for technical line on the basis of their aptitudes. Those in an industrial area having close acquaintance with the machineries and tools or those coming of such environment or family will definitely be in a more advantageous situation than the poor rural population having very little idea about the technical field.

This is one of the practical difficulties for depending upon aptitude tests at the time of curricular guidance.

It is desirable to find out something more fundamental and yet discriminating for the purpose.

The writer is, therefore, of opinion that one's expressed or tested interests, instead of mere potential ones, may serve a better purpose for reasons stated below:

(*a*) Interest assessment is a more fundamental approach as it seeks to discover one's ego-involvement in a particular field or tendency to participate in certain activities.

(*b*) The approach is more consistent with the democratic concept of education and provides greater scope for finding out a broad basis of guidance.

(*c*) Interests represent an intrinsic approach to motivation.

(*d*) Evidence of actual participation in an activity or area of experience could have much significance for counselling or guidance purposes.

There may be some objections against the assumption that interest patterns are formed at the age of 14+ or so.

This is a controversial issue no doubt, but there is psychological evidence of the formation of interest patterns round about this age. Strong concludes that the persistence or interests undeniably prove the fact that the normal person on the whole changes very little with the years in his chief characteristics.

Role of other Personality Traits in Guidance. There are a thousand and one personality traits as will be found in the modern literature on personality study. All of them may not have direct bearing on counselling, but they can be used for clinical purposes better than educational purposes.

A counsellor therefore, must know a few personality estimates of his pupils. Out of several unique traits of personality, persistence, confidence and level of aspiration appear to be highly correlated with attainments in future life. It would be advisable to take personality estimates into consideration and construct standardized tests on those traits for guidance purposes.

Collection of Data. The task of educational guidance is a formidable one as it demands psychological insight as well as the power of manipulation. There are various stages of guidance including collection of data on the individuals.

DATA COLLECTION AND ITS TECHNIQUES FOR GUIDANCE

In order to collect the data on the pupils, various techniques may be adopted. But before that, one should determine the nature of the data to be collected.

What should comprise the Data. The data should generally consist of the estimates of one's personality aspects, viz., persistence, confidence, emotional stability, etc.; abilities, intelligence, aptitudes, physical strength, etc.; attitude and interest. Besides, there are many other aspects which should receive consideration.

Techniques for Collection of Data. Of all the techniques employed for the purpose of effective guidance, observation deserves special mention. But in order to make the best use of this technique it should be used in a systematic manner. After the objectives have been formulated it would be advisable to adopt a uniform procedure after a good deal of planning. For this purpose, different teachers should sit together and define or describe individual traits to be assessed. After each trait has been defined it is better to fix up the scale on which the individuals are to be rated in respect of each trait. There are devices for improving the ratings which may be summarized as follows:

(*a*) Ratings should be made in a systematic way.
(*b*) An extended period of observation should precede rating.
(*c*) It should be kept in mind that rating is something in which the rater may improve through practice just as he grows more skilful in judging the quality.
(*d*) Special attention should be paid to defining the qualities.
(*e*) For experimental purposes, all ratings should be discarded except those which are at the extreme ends of the rating scale and those on which the raters are sure of their judgment.
(*f*) Bias should be eliminated as far as possible.
(*g*) Each quality should be rated individually.
(*h*) There should be instructions for the purpose of rating in the use of the particular rating scale adopted.
(*i*) The ratings should be analysed by the psychologist.
(*j*) There should be re-instruction in which the particular faults and weaknesses of the ratings are pointed out.

It is also important to mention that rating trait-wise is more desirable for minimizing the scope of subjectivity. In other words, the teachers should split up the scale in a convenient manner and try to place individual pupils under suitable categories in the following manner:

TRAIT-CONFIDENCE

(Scale of 5 points)

Category A
Bimal Roy
Biman Singha

Category B
Arup Sen

Category C
Anil Bose

Category D
Sitaram Jeswal

Category E
Putul Chowdhury

Here it can be seen that the rater is not concerned with only one particular student at a time. He should observe a particular trait and record his observations in the respective folio of his diary. For this purpose one or two pages of the diary should be devoted to each category of the scale.

There are different methods of comparison particularly in rating and ranking. Some of these may be described as follows.

A school teacher may arrange his class in order of merit in relation to a particular trait. This is hardly possible when the number of students exceeds twenty. It is best to put each name on a separate card and let the rater sort it out.

If a printed list is given, judges are apt to rank people at the top of the list too high and those at the bottom too low. Ranking method does not provide any absolute value.

The rater is given every possible pair of names and is asked to say which of the two scores is higher. It is usual to convert ranking into normally distributed scores. It is quite simple to combine or average ranking provided by different raters, each of whom may have judged from a somewhat different angle.

In graphic scales, each step is defined as concretely as possible, so that the rater no longer has to bother about standards. The rater merely puts a tick or a cross at the point on the line he thinks appropriate.

Inexperienced raters find this method easier as they can be answered more easily. But they use up to a lot of paper.

It illustrates the device of breaking up a general trait into a number of more specific components which are separately rated and the scores combined. Such components should be relatively independent of one another.

This is a technique of achieving equivalent units to apply the Thurstone method of attitude scaling to a long series of statements.

The following should be taken into account at the time of rating:

(*a*) the number of dimensions in a rating scale ;
(*b*) the number of individuals in each class ;
(*c*) definition of qualities to be rated.

There is a number of factors which initiate the reliability of ratings:

(*a*) differences in persons being rated ;
(*b*) differences in ability to judge ;
(*c*) differences in the traits being rated ;
(*d*) *halo* effect.

It would be obvious that the rating methods are not merely devices for assessing efficiency. This is also a means of gathering information that can seldom be gathered in any other way. So rating as a technique has got a number of advantages which may be outlined as follows:

(*a*) Ratings stimulate the person being rated.

(*b*) Ratings react in a favourable manner on the persons who rate.
(*c*) Ratings, if periodically given, help to keep alive the personal spirit.
(*d*) Ratings help in making judgments analytical.
(*e*) Ratings systematically given, tend to make judgments representative.

The interview is also the most comprehensive method since it more or less makes use of all the techniques. Usually, observation of external appearance, gestures, voice and other modes of expression and of behaviour under the stress of the interview situation, produces evidence regarding behaviour and achievement in the past. There are different types of interview:

(*a*) Diagnostic for discovering facts regarding life history.
(*b*) Research interview.
(*c*) Interview including treatment with social worker.

Validity of interview as a technique is no doubt questionable. But it is earnestly judged by its correlations with other samples and by its capacity to discriminate.

There are other advantages of interview method. For example, the interviewer can clear up misconceptions, and the labour involved is compensated by trustworthiness of the information and the comparative ease in securing data.

The responses in an interview are more natural, informal and spontaneous, and the person interviewed gives the examiner an opportunity to investigate obscure points or evasions. Besides, it permits the examiner not only to collect facts, opinion, attitudes, likes and dislikes, but to find out the way of those responses.

But the interview method has also some disadvantages. Suggestions have too much force in the interview and the interview is much more expensive in respect of time.

Standardisation of the Interview. The object of interview is to draw out information and obtain an unconstrained account of one's prejudices, motives, drives, etc.

Those who advise planning the interview carefully ahead of time are of opinion that questions should be framed and printed in a schedule. But this gives little opportunity to create rapports, and to break down resistance for encouraging free expression. An interviewer should have a good personality and should possess the following qualifications: Familiarity with the field of investigation. He should command respect and possess sincerity, sympathetic understanding and a sense of humour.

Preparation for the Interview. The following are the steps for making an interview:

(*a*) Collecting preliminary information.

(*b*) Making initial contacts and appointments.
(*c*) Securing confidence of the subject and coming down to the subject's level.
(*d*) Stimulating action by gesture, nods, smiles and such other encouraging remarks.

For motivation, however, appeal to ambition and ideals may be made. Techniques for lessening tension and meeting resistance may also be applied.

Causes of tension should be carefully diagnosed. Tension may be reduced by stimulating agreement, minimizing seriousness of the situation, and analyzing a general statement into specific parts.

The following are the general factors which baffle the purpose of interview:

(*a*) A tendency to conceal on the part of the person interviewed.
(*b*) Error of interpretation on the part of the interviewer.

Most recently depth-interview is also being employed for bringing out a spontaneous expression of feeling, and attitudes of the previous interview.

The Questionnaire. The questionnaire is the instrument best fitted to measure conduct.

In answering a questionnaire the issue is not whether a person can answer the questions, but whether he will answer the questions truthfully.

In a questionnaire we eliminate difficulty by making questions as easy and simple as possible.

Tests, in short, are designed to find out what a person can do while questionnaires are designed to find out what a person has done or will do, or how he thinks or feels or believes. A questionnaire may be classified into the following groups:

(*a*) Those asking for facts found on records.
(*b*) Those asking for facts not found on records.

Questionnaire should be used only in an attempt to elicit vital information.

In addition to the above, the self-report documents provide many data which can be compared with those obtained by other methods. Case study is one such method and this may be made effective either through a look into the autobiographies, or collection of information about the past life and activities.

In spite of the application of quite a large variety of techniques, the importance of observation can hardly be denied. The necessity for adequate records for proper guidance is admitted on all hands. But the following points have to be kept in view while recording data:

(*a*) Sufficient care should be taken for recording facts with accuracy.
(*b*) Facts should be recorded with an eye to the purpose and the criterion.
(*c*) While recording facts economy of space should not be lost sight of.
(*d*) The data should not be recorded in a haphazard manner but they should be so arranged that their significance may be observed quickly.
(*e*) All facts regarding an individual should be kept together. In short, the principles laid down emphasize the value of the maintenance of of a cumulative record for each individual.

It can hardly be denied that intelligence still holds an important place as no guidance worker can afford to neglect this means for securing valuable information of this innate ability. There has been a remarkable development in the number and quality of tests of general intelligence and many kinds of such tests are at present available. But while selecting one must pay due attention to the validity and prognostic value as well as the case of administration and scoring.

Standard Achievement Tests. These tests are useful as they attempt to remedy the shortcomings of teachers' tests and make objective assessment possible. Such test is so arranged that answers are given in the same way without giving much scope for personal bias on the part of the examiner.

Personality Tests. These will consist of interest and aptitude tests, and other inventories designed to measure many other personality traits. Thus in the schools of today the use of tests is indispensable for effective guidance.

CHAPTER FIFTEEN

The Principles of Guidance Testing

THUS TEACHER and counsellors are all interested in finding out the individual differences with the purpose of finding out a scientific basis of guidance. The guidance programme is to function effectively with the tools and techniques prepared for assessment. No person can rightly say "I don't believe in tests". When a counsellor deals with an individual student he must obtain and combine wisely as much data as possible. Certain aspects of behaviour may not be fully measured by tests but they can be observed. Tests are only aids to judgment. If he employs test he is to make sure of the efficiency of such test. In other words, the reliability and validity of the test should be the first things to look for.

There are few assumptions on which the principles of guidance are based:

1. The differences between individuals in abilities and interests are significant.
2. Variations within the individual are significant.
3. Guidance is not prescriptive but aims at fostering progressive ability for self-guidance.

Thus the entire method of approach to guidance depends upon the attitude taken towards these assumptions. The task is therefore, that of discovering the innate ability of the individual and exploring his personality. But exploration of personality takes a long time, and endeavour should be made to make it scientific and dependable. It should be based on observation and records.

In other words, there should be sufficient data for arriving at some decision about one's fitness for a particular course.

Tests are used for different purposes. There are some tests which are intended to measure or evaluate attainments and progress while others are used for diagnostic purposes. There are certain tests which serve a clinical purpose by exploration by the phase of personality. Generally tests are used for assessment of one's attainment or standing in a particular field, but recently they have been used for other purposes as well. The use of objective tests is becoming very popular because of its reliability. With the recognition of the importance of guidance programmes in our schools, tests have become almost indispensable, but unfortunately in India the number of such dependable tests is very limited.

SOME BASIC IDEAS IN MAKING AND USING TESTS

All the guidance programme has the common objective of understanding the individual and should therefore, operate in accordance with certain basic ideas or principles which may be summarized as follows.

A test is generally a short standardized sample of an individual behaviour. A test-maker's primary tasks are to identify different traits in an individual, to develop those traits and to construct tests for measuring the traits. First he should take sample of behaviour in each trait for incorporation.

There should be a wide administration of the test to an adequate sample of the population. A clear account of the kind of behaviour-sample of population on which the test is standardized should also be given.

The tests should have also practicability, besides their validity and reliability. The counsellor must consider the cost of the test as well. In general he should gradually introduce test and testing procedure. The testing programme, in short, should mainly include three types of tests—achievement tests, personality tests and interest tests. These tests yield data that are essential in determining students' progress and in guiding students' plan.

Above all, a guidance testing programme should be planned according to the available test materials and personal resources. From the experience of a great many schools there is a consensus of opinion that a guidance programme should include testing, observing and recording with reference to the criteria. It should be designed to meet the need of the individual students. Information about personality traits, physical and mental health, work experience an occupational opportunities should be derived by various means. The sources of such information may be autobiography or self-report documents and cumulative records mentioned before.

Tests are nothing but means of appraisal. Sometimes this process of appraisal is also described as evaluation. But before applying the tests the objectives of testing should be formulated. In fact the traditional examination has failed to detect the individual differences very accurately. This is why the need for objective types of tests has been felt.

The place of tests in an appraisal programme is unquestionable, but tests have their limitations. Even while supplementing essay type tests, one wonders as to how to make a balanced use of the objective tests so much spoken of today.

There are various types of tests, for example attainment tests, intelligence tests, personality tests, aptitude tests, etc. But the objectives of all such tests must be somewhat as follows:

(*a*) To get some numerical estimates of the quality or trait under assessment.
(*b*) To find out the individual differences in terms of scores.
(*c*) To obtain some objective scores for the exploration of one's personality.

In short, all the tests and techniques are designed to make a complete survery of the particular trait from a particular angle.

Tests are mainly of two kinds: (*i*) Individual tests and (*ii*) Group tests. Individual tests are those which can be applied only to a particular individual and thus they demand individual care and attention.

Group tests can conveniently be administered to a number of subjects. In this respect group tests have got an additional advantage.

There are some tests which are used for selection and some for guidance. The tests for selection are generally those which demand power and speed from the subject but the tests for guidance and diagnosis should be exploratory in nature. In other words, such tests should give the subjects enough time and scope for doing their best. There are other purposes which are served by psychological tests.

Every test should pass through the stages of validation and standardization if it is to yield maximum result. Tests are standardized only when the norms for a particular age-range are established. But unfortunately there are few tests which are standardized, as standardization is a tedious process which takes a long time. Therefore, *ad hoc* tests are prepared for serving immediate purpose. Besides this there are the important considerations regarding the time taken for administration and scoring of the tests. There are some tests which take a long time for scoring ; naturally such tests should not be regarded as ideal ones for practical purposes.

Now-a-days there is a tendency towards making long tests containing several sub-tests but Vernon has pointed out that a test in order to be effective should not be too long, as the same may give scope for fatigue. There are various approaches for assessing ability, temperament, attitude or attainment. In all cases, tests present a number of situations, which are either concrete or abstract, for drawing out the particular information about the subject. In some cases there are tests in respect of difficulty, power or level of attainment. This type of test is designed to determine how difficult a task a person can do, or how difficult a problem he can solve. The tests consist of a series of exercises arranged in order from the easiest to the hardest. The pupil begins at the easy end of the tests and goes as far up the list as he can in the allotted time. In most tests of this type a liberal amount of time is allowed in order to make it a power test instead of a speed test. The speed test is usually designed to measure the amount of work of a uniform quality and difficulty which a pupil can do in a given time. A definite time-limit therefore, becomes indispensable for this type of test. For example, a test of speed of reading consists of a number of passages. The score is then based on the number of passages read. Speed tests are mainly restricted to important skills such as speed of reading, writing, typewriting, etc. Besides power and speed tests, there are other types of tests, for example, range test, accuracy test, quality test, mixed test, etc.

Range Test. There are certain tests where the range of information or skill can be measured by determining the number of correct responses given or tasks correctly executed out of a number selected to cover a particular field. Such tests are employed to survey the pupils' knowledge in history or other subjects. In a pure range test the time allowance must be liberal so as to eliminate the factor of speed of performance which may be measured separately.

Accuracy Tests. There are tests specifically meant for measuring the accuracy of performance. The accuracy of pupils' work can be indicated by the percentage of error made in a test.

Quality Tests. Quality means different things in handwriting, art drawing, singing, contributing to perfection of an art. Thorndike's scale for quality of handwriting is an example of this type of test. According to this scale the pupil is first given a standardized test in writing. Then competent judges slide this sample up and down the scale in a standardized way until they find a sample on the scale which matches the pupil's product. It is obvious that here one is to depend upon the subjective judgment of the person who compares the pupil's specimen with the scale. In this case, however, reliability can be increased by securing the independent judgment of several experts.

Mixed Tests. Tests may be devised to measure the different aspects of one's performance, for example, speed, range, accuracy, etc. There are many tests which instead of attempting to measure a single aspect try to secure a rough estimate of general all-round ability of a person by combining different measurements of these elements in different ways.

In this connection it may be mentioned that this helps the experimenters to arrive at a rough and general measure only.

There are various types of mental tests devised to measure various mental attributes and functions. One type of mental test is devised to measure various mental attributes and functions. Another type is devised to test knowledge (attainment tests). Attainment tests are likely to be of different varieties depending on the subject taught in the curriculum, and are converted into standard scores by a comparison with the abilities of average pupils at different grades or by a comparison of the scores with the abilities of average pupils of different grades, or by a comparison of the pupils' scores with the abilities of different pupils of same age or grade. The score resulting from the first type of comparison is usually called age score. The principle of the age score for achievement tests is subsequently the same as that underlying the mental age scale. In securing the grade score, the pupil's raw score is inserted into an average grade status instead of age position. Thus if a pupil's score in an educational achievement test is equivalent to the average raw score of pupils at the beginning of grade four this pupil secures a grade four.

Various other types of scores are in use. In most of them the score is derived from the distribution of the pupils of a given age. The simplest score is the percentile score beginning from the lowest and zero percentile.

Intelligence Tests. A number of tests on intelligence has been evolved by many with a few basic assumptions which are as follows: (*i*) in the midst of conflicting definitions, intelligence has been supposed to be hereditary: (*ii*) it has also been supposed that intelligence does not increase beyond a certain age. It was Binet who first attempted to construct intelligence tests. Binet's original tests were meant for French students and later on these were translated into English for use in England and the U.S.A. This attempt was improved by Terman and by some other followers like Merill. Terman found after a very wide administration of the tests that intelligence of age groups is more or less normally distributed. There have been various adoptions of these tests in India. Binet's test or its Terman revision is an individual test in which each person is tested separately. Though it allows a certain amount of flexibility, it is very time consuming.

Wechsler has evolved in Bellevue University a combined test of groups of items, six of which are of the verbal type and may be applied to the illiterate, and the other five of the performance type applicable both to literate and illiterate. Both the categories have been standardized separately as well as together. In fact, Wechsler's aim at evolving the tests seemed to be twofold: (*i*) He wanted to find out objectively whether ability known as verbal intelligence is interrelated to abilities of the preformance type of activities. (*ii*) Further he wanted to find out a scale by which an adult's intelligence would be measured. Binet's test or its Terman revision can register mental age only up to twenty-two years and ten months. Wechsler's scale of intelligence is somewhat in between Terman's conception of intelligence quotient based on the consideration of mental ages and the point scale for finding a percentage rank of a person's achievement compared with his own age group. Wechsler does not write his answers on a simple, point scale. He takes Binet's conception of intelligence and holds that median intelligence should be rated at 100. He thus takes 100 as mean statistical concept. Thus the scale resembles the point scale with the adjustment that it is distributed over 100 and 10 points. Wechsler has found a fair degree of interrelation between the performance and verbal intelligence and his scale is able to measure intelligence in terms of *I. Q.* for all age groups up to fifty years. The tests of intelligence of a simpler type are those of maze learning or draw-a-person test. This test measures spatial relationship which is only one aspect of intelligence. Koh's block test measures both spatial relationship and ability to perform. More complicated performance type also has been evolved like army Beta test which is like army Alfa, a group test. In India at the Psychological Bureau of Allahabad, Bhatia has evolved a battery of tests which is an adaption of several tests including Koh's block test, Alexander's pass-along test and others. The objection that is often raised against these tests is that they are not entirely culture-free tests, but to meet this objection, some have been evolved. Raven's progressive metrices tests have been designed to measure (General Factor) *G* factor of intelligence by abstract designs. On the whole intelligence is still a matter of controversy, and so the tests for assessment of intelligence are still looked upon with suspicion by a school of psychologists of the day.

A sociometric test is a means to measure the amount of organization shown by social groups. The sociometric test requires an individual to choose his associates in any group of which he might become a member. He is expected to make his choice without restraint and irrespective of whether the individuals chosen are members of the relevant group or not. The test determines the position of each individual in a group in which he has a function for instance in which he lives or works. It revealed that the underlying *psychological structure* of a group *differs widely* from its social manifestations:

1. Group structures vary directly in relation to the age level of the members ;
2. Different criteria may produce different groupings of the same persons or they may produce the *same groupings* ;
3. Groups with different functions tend towards diverse structures ;
4. People would group themselves differently if they could ; and
5. These spontaneous groupings and forms of groupings which are super-imposed upon the former by some authority, provide a potential source of conflict.

It was found that chosen relations and actual relations often differ and that the position of an individual cannot be fully realized unless all the individuals and groups to which he is emotionally related are included in the test.

It disclosed that organization of a group cannot be fully studied if all related groups or individuals are not included, that individuals and groups are often inter-locked to such an extent that the whole community to which they belong has to become the subject of the sociometric test.

METHOD

Group functions may be studied in three ways. The first may be called observational and interpretative. We may watch the children when they are free of any supervision. They run out of school to the playgrounds. The manner in which they group themselves spontaneously is noteworthy.

To reach a more accurate knowledge of group organization, the sociometric test is used. It consists in an individual choosing his association in any group of which he is or might become a member.

As these choices are initiated by the persons themselves, we get an insight into how the group structures of their own *look* compared with group structures imposed upon them. This method is experimental and synthetic.

Construction of the Test. The problem is now to construct the test in a manner that would be in itself a motive, an incentive and a purpose primarily for the subject instead of for the tester.

A Sample of a Sociogran in a Girls School. No. 1 is liked by fourteen girls and disliked by only two. This girl is a bright student. She always stands first in the class. She is good at drawing, well-behaved and always with a smiling face. No wonder she is appreciated by most of her classmates.

No. 6 is liked by twelve girls and disliked by only one, a mutual dislike between herself and No. 9. This No. 6 is a young girl, younger than most of her classmates and is also intelligent. She has a pleasant bearing and particularly long hair. She is bold and enthusiastic, good at dramatic performances, and, of course, these qualities have made her the centre of attraction and the leader of the class.

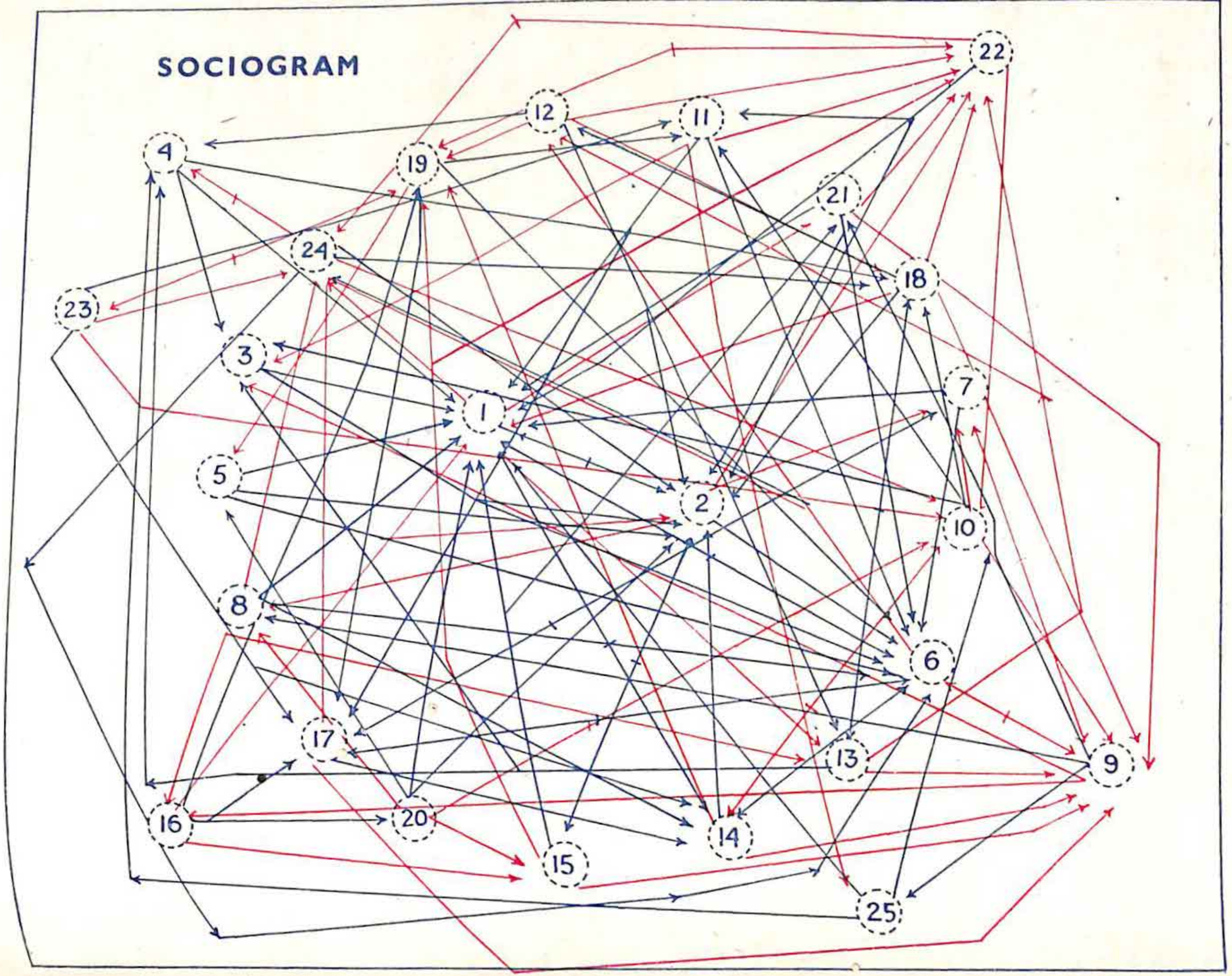
No. 2 is liked by eleven girls and disliked by only one. She got an attractive personality, sweet to look at and modest in behaviour. She is also among the bright students of the class. So again it is natural that she is liked by her fellow girls.

Thus these are the three leaders of the class. They are also the leaders of the different study groups. Other girls seek their help and they provide a willing hand.

No less important is the girl who is mostly disliked. Disliked by nine of her classmates, she also dislikes many girls. She is not a dull student, nor ugly to look at. Before coming to this sociometric analysis, the writer thought about her in terms of a leader. Last year she was one of the five captains of the class, but now only does the sociogram show that she is so widely disliked.

This case actually needs proper studying and the writer wants to take her

SOCIOGRAM



up for his future case study. Just now we can only guess, perhaps correctly, the cause of her being disliked. She looks to be a bit proud and stubborn, perhaps because she belongs to a rich family fond of showing themselves superior to others. She might be quarrelsome, as she is a bit stubborn looking. So these may be the causes of her being disliked.

No. 22 is also disliked by nine girls. She is an average girl or even a bit below average, weak in many class subjects.

It is not a pleasant thing to know that one is disliked by his next-desk classmate, sometimes by the very person whom he likes most. And girls are specially careful in this respect. So even after assurances of keeping everything very confidential on the part of the writer, most of the girls did not openly tell of their dislikes. Anyhow, a few others were bold enough and so helped in collecting the required data.

The questions put to the pupils were:

1. Give names of five pupils of your class whom you like best.
2. Give another five names, whom you do not like.
3. Name the pupil you like most.
4. Name the pupil you do not like at all.

After collecting the required data, the frequency table is prepared. Each girl is given a number and her likes and dislikes are also transformed into numericals.

The sociogram of these likes and dislikes is then attempted. The likes are shown in blue arrows and dislikes in red ones. Mutual likes and dislikes are shown by a single blue and red line, arrowed at both the ends and crossed in the middle. This may be attempted several times, and the positions of the numbers are changed according to the convenience in order to minimize the complications. Thus attempting not less than five times, the final sociogram came into existence which shows only likes and dislikes of a pupil.

By the sociogram some very interesting cases may come to light.

There may be stars on it. That is, some pupils may be the centre of attraction. They may be liked by most of their classmates.

CHAPTER SIXTEEN

Typical Cases of Guidance

CHILD GUIDANCE

IN RECENT years, scientific periodicals have borne testimony to the loss of man-power that has resulted from illness produced by mental causes. Accident-proneness, absenteeism and truancy are evidence of this sort of ill-health. There are many instances of delinquency. Helping the child in fighting the illness in some way or other, and resolving the internal conflicts is thus an important task.

Every child, as he grows through childhood and adolescence to maturity must learn first to assert himself against society, and secondly to accept society against himself. In infancy, his physical and economic dependence and his lack of experience combine to induce him to conform to the dictates of others against his own desires. Since only through his contact with them does he feel secure. As he develops and his experience grows he begins tentatively to express his own wishes. At this stage it is just as important that he should have freedom to do this or that. Thus he can learn gradually to tolerate the insecurity of standing alone. Along with this lesson must come its complement—the realization that we always live in a society which expects us to adapt our individuality to its welfare.

General Causes of Maladjustment. In considering the cause of maladjustment it is necessary to follow the main factors: (*i*) the process of emotional development ; (*ii*) the possibility of conflict within the personality ; (*iii*) the possibility of conflict between the personality and the environment.

What then are the essential differences between the new-born baby and the mature adult? The most striking is the complete dependence of the infant, and in comparison the wide freedom of the adult a freedom which is physical, emotional and intellectual within the person, and social and economic without.

The second and closely associated difference is the need of the child for security, and the capacity of the adult to live in an atmosphere of relative insecurity. It is clear that a part of any normal development is the process of adjustment in these two respects, the capacity to tolerate some degree of insecurity, to take certain risks, and to enjoy independence and freedom as a compensation. But this carries with it a third important difference between the child and the adult, namely the relationship between the individual and the society of which he is a part. The infant is the complete individualist caring nothing for the needs of the society in which he lives, intent only on gratifying his own needs and desires, but the price which the adult pays for his freedom is that of an acceptance of a relationship with society and a measure of responsibility towards it.

It would be clear that in the development of the child and the process of adapting himself to the adult phase of life, there are many and varied opportunity for the growth of conflicts, both within the personality of the individual and between the personality and society. Many fail to achieve maturity in a full degree and merely achieve a physical and possibly intellectual appearance of the mature.

On the physical plane life is a simple matter for the infant. His food is of one kind and obtaining it needs little skill on his part. He is moved from place to place and kept warm through the care of other people ; but in growing up he has to acquire many kinds of skills which need the co-ordination and integration of various parts of the physical get-up.

So on the psychological level the child is endowed with certain hereditary faculties, some of which function immediately and others which develop only with the process of growth. First in the scale are the instinctive fundamental needs and desires which demand immediate gratification, parts of our primitive make-up which we share with the lower animals and which are more firmly rooted in us than any of the latter superstructure. They are concerned entirely with the gratifications of the individual, and we are oblivious to the needs of society. By the time the infant has reached the toddling, prattling stage, we begin to see a new face in him. Already he has become aware of the demands of the society, and therefore, has realized himself as an individual, a person within it. He has also achieved his first steps in a very literal sense to independence. He can get to where he likes, he can say what he wishes, he can reach and touch what he wants. All these are in a limited sense, but it nevertheless puts him in the way to discovering opposition and frustration at the hands of other people. He realizes in himself two forces either accepting society or in opposition to its frustrating power. These forces may also be in opposition to each other.

ESTABLISHING AND ORGANIZING A CHILD GUIDANCE CLINIC

In the initial establishment of a child guidance service two separate aims must be kept in view. First, the clinic needs the best facilities for dealing with the diagnosis and treatment of the children referred to it. Secondly, the clinic should be organized as a potential educational service in the psychological aspects of the children's development. The aim should be to have this service available for all categories of people connected with education and upbringing of children.

Before any clinic can be established a degree of understanding of the aims and methods of child guidance must be achieved.

The person in charge of the establishment will need something more than knowledge of child guidance. He must also have a broad view and experience of people sufficient to overcome individual prejudices and to seize the opportunities of propaganda as they arise. There are frequently members of any lay committee who will oppose a movement simply on the grounds that they do not understand it. Such opposition has a high negative value to any rapid progress. It is the education of these members that needs skill and patience and the fruits of wide experience.

The choice of administrative body under whom the clinic is to run will depend largely on the people who have been the moving spirits in recognizing its needs and formulating the demand.

The organization of any clinic (in the beginning) provides certain main problems to be faced. These fall under the headings of finance, the securing of properly trained personnel already described in the Introduction, and the provision of adequate housing and equipment.

The financial problems of clinics deserve special mention. The minimum requirements for the housing of a clinic is four to six rooms. The psychiatrist, the psychologist and the social worker each requires one room, and further rooms are needed for the visiting parents and for the office. A large play room if possible is also a welcome addition. Every effort should be made to decorate these rooms in bright cheerful colours. The clinic should be centrally situated in a position easily accessible by public transport services.

The aim of most clinic personnel is to secure for their clinic a spacious house with a garden where the atmosphere is homely and friendly and they have room to expand. (This, however, is usually not available in the centre of a town.) In such a building, children can relax more easily and when they realize that they can rely on ease and understanding, they come freely and joyfully.

The necessary equipment for the clinic is not elaborate. Apart from the usual requirements for a simple medical examination and some intelligence testing material, it consists mainly of normal, comfortable and strong furniture and an abundance of toys. In choosing the toys it is well to remember that it must stand up often to rough and even fierce handling and that it must give as much stimulation as possible to the child's phantasy play. For this, toys representing all the common objects of everyday life are invaluable. In choosing furniture the importance of strength and comfort should be the foremost consideration. A minimum demand for comfort should be easy-chairs in each room so that the child, parent or the clinic worker can be at ease during the interview. In addition to a normal-height desk or table, there should be low chairs and tables for small children. There should be small rugs so that the children can play comfortably on the floor.

The type of testing material required depends partly on the preferences of the psychologist. It consists usually of the current revision of the Binet scale in duplicate forms, some performance tests and the Merrill-Palmer material for very young children and some projective tests.

Direct contact between schools and clinics is of first importance. We have occasionally met teachers who have expressed the feeling that to refer a child to a clinic for bad behaviour is a reflection on the discipline of the school ; and they struggle along with their problem child hoping to avert the necessity, not realizing that they are thereby sowing the seeds of later disaster. It does not follow that all bad behaviours in school should be referred to a child-guidance clinic. Far from it much of the so-called bad behaviour is perfectly normal and natural and often the far more serious problem is the over-good child. But bad behaviour which is purposeless and obviously pathological or which reflects a sudden change or is out of keeping with the child's general character and background is commonly a matter needing an outside and informed opinion. Perhaps if the general public were less prone to say that the school is responsible for a child's character development and more apt to remember the axiom of Ignatius Loyola, "Give me a child till he is seven and I care not who has the handling of him after", they would realize that schools effect on the emotional development of the child at least where the foundation has started soundly. In that case the teachers of those older children would find it easier to feel blameless for the difficulties of their charges and more willing to ask advice about what they can do in these unfortunate circumstances. Naturally this fear of the blame which may be laid at their door does not apply to more than a small minority of teachers. Some are keen to help and some to accept expert aid from outside.

It is seen that a student's scholastic ability is important as an index of later educational and vocational adjustment. Students' achievements vary in spite of the same schooling. There are certain reasons which may be attributed to this difference—(*i*) Health condition, (*ii*) Personality adjustment, (*iii*) Interest, (*iv*) Aptitudes, (*v*) Family background, (*vi*) Environment.

It is often the result of an individual enquiry that some suffer from mental retardation. But on an analysis of the causes it will be evident that there are certain factors which are hereditary and which results in this difference. There is another problem concerned with individual difference, namely, the problem of the gifted children. Few of them create problems to the teacher. It is often observed that an ordinary lesson becomes dull to those who are gifted and difficult to those who are backward. It would perhaps be wise, therefore, to determine the different levels of mental retardation. Three levels of the mentally retarded may be described as follows.

These are (*i*) the educable mentally retarded, (*ii*) the trainable mentally retarded, (*iii*) the totally dependent mentally retarded.

PROBLEM OF EDUCATIONAL RETARDATION

The problem of educational backwardness is a serious concern with all the educationists of the day. In spite of the various modern trends in education this intricate problem is gradually proving colossal. A backward child is described "as one who would, in the middle of his school career be unable to do the work even of the class next below that which is normal for his age". There are different types of retardation—emotional, social, physical and educational. Our present thesis is limited and we are mainly concerned with educational backwardness.

How to Detect Educational Backwardness? Educationally backward pupils may be detected through their attainments in the class and in different examinations.

It is practical to tabulate the results of periodical tests and examinations against each name and locate backwardness. Backwardness may be in specific subjects or in a large number of subjects.

In doubtful cases, objective tests results may be obtained.

Diagnosis of Backwardness. Backwardness may be due to various reasons and as such needs diagnosis. Different tests and techniques can be applied for a proper diagnosis of the problem.

The writer undertook some investigations which revealed the following:

1. There are inherent causes of backwardness mostly relating to personality maladjustment.
2. There are other environmental factors which lead to backwardness.

It would, therefore, be advisable to prepare a questionnaire for collecting information on the following points:

1. Occupation and income of the guardian.
2. Education of the guardian or any other member of the family.
3. Possibility of getting help and guidance from any member of the family.
4. Relationship between the members of the family.
5. Whether there is any suitable place for study at home.
6. Whether the student has got all the text-books and facilities for study.
7. Whether the student gets sympathy and encouragement from the elderly members of the family, etc.

It was found that almost all the cases of backwardness are due to a number of the above-mentioned factors.

CAUSES OF RETARDATION

Home Conditions.—(*A*) Poverty : Let us first of all consider the environmental influences. It is clear that poverty in itself does not necessarily cause backwardness. Nevertheless, even if it is not the sole or major cause, poverty certainly is an important contributory factor as numerous case histories demonstrate. It operates in two main directions. It impairs health ; and it limits general knowledge. By weakening the child's physical vitality, it lowers his capacity to learn ; and by narrowing his mental range it deprives him of that elementary fund of worldly knowledge and experience that most schools take for granted.

(*B*) Intellectual : So far as the child's progress in school is concerned, the intellectual conditions of his home have a far greater and a much more direct influence than the economic or material conditions. In a household of average culture the child begins his school life with the foundations well laid. Before he comes to the Kindergarten he has been encouraged to read some gaily coloured picture-book and to pen a few letters. As he grows older he joins in the conversation of his parents, and is taken to places of interest, to the countryside or the seaside for his holiday. He thus picks up almost as much general information from his family as from his teacher. It will be wise to compare all this with the conditions in those numerous working-class homes where, though the material conditions may be quite as good, intellectual interests are lacking.

(*C*) Emotional: When studying the causes of emotional or moral disturbances like psycho-neurosis or juvenile delinquency, we naturally attempt to secure information about the emotional or moral conditions in the home. But directly or indirectly such conditions may have a very great influence on the child's educational progress. The key to much inattentiveness in the class-room lies in the events of the child's daily life at home The anxieties, the quarrels and even the gaieties of his relatives are apt to upset his own self-control ; and as every teacher can testify after each week-end and each long vacation, many pupils come back to school worn out, unsettled and often utterly demoralized. If in the home there is a general attitude of slackness and evasion, the child himself is likely to become unpunctual and an absentee. Without actually developing into a thief or a criminal he may grow deceptive and unscrupulous over minor matters and so may turn into a truant or a cheat.

The idea that a child's character can be judged by just seeing him in the consulting room is as absurd as trying to reduce the mode of life by looking at pressed specimens between the pages of a book. The psychologist insists on observing each child not in vacuum but in the class-room, playground and above all among the members of his family at home.

Conditions outside the Home.—In considering the environment in which the child has grown up, it is important not to overlook the kind of neighbourhood in which his home is situated and the sort of companions he meets among the neighbours or in the streets. Such influences as is well known have considerable importance in the causation of juvenile delinquency ; and delinquency and backwardness go hand-in-hand.

School Conditions.—(*A*) Irregular Attendance: Let us now turn to the conditions within the school itself. The first and most obvious cause of failure in school progress is non-attendance. In the present inquiry, among as many as 11 per cent of the backward cases, the chief cause of the child's inability to progress was inadequate or irregular attendance. The child had been admitted late, or had been absent on numerous occasions, or away for long periods at a time. Much of this was excusable owing to exclusions for ill health. But a good deal arose from sheer negligence or from delays connected with migrations from one district to another.

(*B*) Inefficient Teaching: One reason perpetually cited for backwardness is sheer inefficiency of teaching. During the early phases of compulsory education the teacher was likely to be severely criticized if any of his pupils failed to reach the standards prescribed by the official code. The result no doubt served as an impetus to teachers.

Practical Corollaries.—This review of the environmental conditions which seems to be more particularly associated with educational backwardness may serve in some measure to indicate the kind of supplementary or counteracting influences that require to be brought into play if we are to undo the harm that has already been done. Where the home conditions cannot be improved or the parents remain permanently unco-operative, the ideal remedy is to remove the child to a residential school.

Roughly speaking a too exclusive emphasis is commonly laid on the material and moral conditions within the home and too little on the emotional and cultural condition.

The educable mentally retarded child is one who, because of a low mental development, is unable to profit sufficiently from the programme of regular elementary school. The term trainable is used here to differentiate the educable retarded child who can learn some academic subjects in school and who is developing at such a slow rate that he is unable to profit from the programme of instruction in spite of his potentialities for learning. The totally dependent child is one who because of severe mental retardation is unable to be trained in self-care, socialization or economic usefulness. It is, therefore, evident from the above discussion that the child requires continuous guidance. From the initial entrance of the child into the school, guidance should be based not only on the basis of the child's age, but also on mental, physical, social and emotional maturity. The continuous progress of children should be under teachers' careful observation and at every stage of the child's development there should be teachers' help and guidance. It cannot be denied that the use of the individualized materials ensures continuous progress in a particular subject but the extensive use of such materials in elementary level as in the Winnetka or Dalton plan is often criticized. Since continuous progress means that pupils move through their educational experiences at rate suited to them, occasionally a pupil may need to stay in the same level for a longer time. The transition of the pupils from grade to grade should receive greater attention of the teachers and counsellors. Otherwise there is every possibility that the number of retarded children will increase.

Guidance to Slow-learning Children. The slow-learning children of varying degrees are found to form an important section of the school population. The measurement of their aptitudes and determination of their needs should therefore be accomplished by well-trained and experienced psychologists. The slow-learning children may, however, be identified with the help of various tests. But the main characteristics of these children can be described as follows:

(*a*) Short attention and concentration span
(*b*) Slow reaction time
(*c*) Limited ability to comprehend
(*d*) Limited power of self-direction
(*e*) Limited ability to work with abstraction
(*f*) Slowness to form association between words and ideas
(*g*) Failure to recognize familiar elements in new situations
(*h*) Habit of learning very slowly and forgetting quickly
(*i*) Lack of originality
(*j*) Inability to analyse
(*k*) Lack of power to use the mental process.

Even though slow-learning children possessed characteristics quite unlike those of the other children in school, it should be remembered that they are like other children in many respects. They have much the same interests, desires and ambitions as other children have.

One of the significant trends in modern education is the practice of grouping slow-learning children for much greater individual attention. The present tendency is to recognize a wide range of abilities and needs and then to group the children homogeneously on the basis of social and physical development. Their needs, learning rates and aptitudes may be determined and used as the basis for forming a number of flexible learning groups within the larger groups. In other words, the success of educational programme will depend upon how much more has been taken for diagnosis of the cause of retardation with a view to finding out its remedies. On an analysis of the causes, two types or groups of factors will be found to play their role in retardation of which environmental factors are the main concern of the educationists. Of the hereditary factors intelligence, physical health and temperamental features deserve special mention. Of the environmental factors home condition, unhealthy neighbourhood, irregular attendance and bad schooling deserve mention. Stress is being laid strongly upon the child-centred approach. Learning experiences are tied together in meaningful relationship around interests of the children, and guidance is recognized as a vital factor in effecting total development of the child. The curriculum, the method of teaching, the class room environment must be suited to the needs of the child. It is true that the solution of many problems relating to retardation is not always under the control of the educational institution. In fact, there are some steps which can be taken effectively for fighting this problem. The steps may be outlined as follows.

(1) Launching new assignments or activities for slow-learning children. The teacher must make sure of the goals of each new activity that are introduced to the students. The work assignments that are adjusted to the needs and capacity of the child should be drawn out with great care.

(2) Adjustments to additional drill and short memory span for slow-learning children. The slow-learning child, because of his limited ability to grasp concepts readily, will need more repetition to learn than a normal child. Drill activity should be so motivated that it will not become monotonous and dull. All types of mental imagery should be brought into use and incentives such as play, dramatic performance, etc., should be given to stimulate their actions and interests.

(3) Adjustment during group discussions: The lessons given by the teacher should be followed by group discussion. The teacher should take care in the choice of vocobulary. The slow-learning children require more time to organize and express their thought. They should be encouraged to express themselves orally and the teacher should give them opportunity to do so.

(4) Building learning experiences around interests: Interests of the slowly learning children should be discovered and utilized in teaching. The teacher may have opportunities to generate new interests for motivation.

(5) Emphasis on self-evaluation: Each child should be able to see and feel that he is making progress. Recognition and praise should conveniently be employed for motivation of the children.

(6) Emphasis on supervision of study habits: Since the typical slow learner has poor study habits and does not know how to approach a problem, closer supervision is needed. He needs more than the usual amount of definite instruction of drill, and on needed habits and skills in specific situations.

(7) Emphasis on concreteness: The slow-learning child easily gets confused with abstraction. He can better understand concrete learning experiences. Any teaching aid, auditory or visual, will therefore help the understanding of the child to a great extent. The traditional curriculum should be supplemented by a vocational basis. It is sometimes observed that the slow-learning children surpass normal children in their motor capacities.

(8) Needs for diagnostic and remedial procedure: As mentioned above the capacities and limitations of each slow learner must be known by the teacher. So there is a great need for diagnostic and remedial procedure with slow learners. The diagnostic test should therefore be employed as valuable tools with the slow-learning children.

The Slow-learning Pupils and Vocational Education

There is a wrong assumption that all slow-learning children should be directed into curricula of vocational nature. But this viewpoint has been found to be utterly absurd. It is not always true that all the slow-learning students have the necessary aptitudes to acquire vocational skill. Vocational programme should not therefore be forced to admit students who would be misfits.

General and Special Abilities. While discussing general and special abilities, one should take into consideration the different traits of personality and the specific aptitudes of a man. The teacher too will require special qualifications, and the teaching methods will have to be suitably adapted to the psychological needs of the pupils.

Size of Class. The prime requirement of all retarded children is more individual attention. Hence the first and fundamental characteristic of classes for the educationally sub-normal should be their small size. The number accommodated will depend on many different conditions and may even vary with the various subjects as well as with the age of the pupils. It is commonly to be assumed that in the ordinary elementary school the ideal class should not have more than forty, and in the special school for the mentally defective not more than twenty. Accordingly, we might reasonably infer that for the dull and backward the size should not exceed twenty-five or thirty.

Qualifications of Teachers. Care and forethought will be required not only in the choice of the pupils, but also in the selection of the teachers. Too often the headmaster thinking first of his top forms and most promising pupils leaves the backward class either to the youngest and least experienced of his teachers or to the oldest, the least competent, and the least progressive. What it plainly needs is a teacher of exceptional efficiency and wide resources. Different age-groups call for teachers of different types. Hence each teacher's age, sex, health, personality, training and special gifts must be reviewed in relation to the work he has to do. In any case he will need a first-hand knowledge not only of the dull, but also of the difficult youngsters, and an observant eye for the symptomatic peculiarities of their everyday behaviour. He should be a man of practical rather than academic inclinations, with interests that are concrete rather than bookish, as also a talent for manual work and artistic expression. A training in psychology, practical and not merely theoretical, will prove a helpful asset. Above all, if he is to be really successful, he must look upon his task not as a burden but as a pleasure.

The teacher of a backward group is found to figure far more prominently in the lives of his pupils than he would in the lives of normal children in an ordinary class-room. Standing behind his desk, the visible embodiment of knowledge and power, he may at first inspire the dull and apprehensive youngsters. The teacher must come down to earth, mix with his pupils on sympathetic terms and deal with them not in the mass, but as individuals. As far as possible, each child should comè to regard him rather as a personal tutor than as the master of the class. Towards each one, and towards the various difficulties, he must cultivate an attitude that is human as well as scientific.

Case Studies and Progress Records. With the backward child the first and most essential step is not to hurry up and teach him, but to try to understand him. The teacher must start by thinking not of the subjects to be taught, but of the pupils he is to instruct. As we have seen lack of progress in school is often a symptom only ; and, before the symptom can be successfully treated, it is essential to study the nature of the underlying trouble and to discover its probable cause. Each child, therefore, must be made the object of a small intensive research.

This results should be systematically recorded. For every pupil who is educationally subnormal, a permanent note of progress and development should be preserved and the case histories kept up-to-date. From time to time, each child should be re-examined and re-tested and the data thus obtained, together with incidental observations of his behaviour and development, should be methodically recorded at least once a term.

Time Table. In order to make room for the newer subjects and these novel methods of instruction, much that is traditional in the ordinary curriculum may be scrapped without scruple. It is better to dispense with all that fails to appeal to the natural interests of the child. The idea that useless or uninteresting exercise may yet prove valuable as a mental gymnastic has, in fact, little or no basis.

In arranging the school time-table the old lines of demarcation between one subject and another may be dropped or cut across. Both topics and methods of instruction should always be correlated as intimately as possible with the different interests and activities that emerge spontaneously at successive periods.

Incentives. Perhaps the most important requisite of all is a constant appeal to appropriate motives. In the ordinary school the normal child is usually expected to find a motive for himself. The duller child needs a sharper, a more varied, a more personal stimulus. Duty for him at this stage is little more than an abstract word; he will exert himself to the utmost only when he is spurred on by some concrete emotion. Half the problem of keeping such youngsters intellectually active consists in discovering the right incentives. Whatever their intelligence can readily grasp and in which their interest can be readily aroused should be introduced.

This search for the natural interest of the child is greatly simplified when we have discovered his own peculiar talent, where he is gifted rather than where he is weak. We must therefore make the most of each child's strongest points and compensating aptitudes and interests. Most dullards will have failed so often that they will always be expecting to fail again. It would be fair to keep them usefully occupied and then they will quickly begin to learn. As far as possible, it is also desirable to avoid reproaches, and remove the ingrained sense of failure by giving each child some special kind of work in which he can quickly achieve conspicuous improvement and feel the glow of a personal triumph. Another practical method is the effective grouping of the children. It will be wise to divide the pupils into suitable groups so that the individuals may mutually benefit through exchange of ideas. The study of group dynamics is also helpful for personality development.

Sociometry is one of the most popular techniques for studying the social inter-relation, and this can be introduced in our schools for effective teaching.

CHAPTER SEVENTEEN

Evaluation in Our Schools

THE RECENT developments of the concept of evaluation were impelled by the realization that paper and pencil tests can measure only a limited portion of the outcome of instructions and types of pupil's behaviour. This concept has been regarded by many as a more comprehensive substitute for traditional examination. The limitations of the old type of examination system have led to the increasing recognition of the total personality assessment. But this is no doubt a formidable task and no single technique is adequate enough to cover all the aspects of child behaviour.

The need for evaluation is, therefore, felt for finding our children's potentialities, the efficiency of methods of instructions, the impact of school situation and the analysis of the behaviorial changes in children in the light of the objectives formulated. Thus evaluation meets a variety of needs in the field of education.

The four stages of an evaluation programme are indicated as follows:

1. First any evaluation should set some clear objectives before a programme is taken.
2. With a view to attaining the objectives already formulated favourable learning situations are to be provided.
3. The changes in the behaviour and field of experience of a child are to be noted with reference to the expected changes.
4. Proper tools for assessment of the impact of the learning situation have to be evolved for determining how far the objectives formulated have been fulfilled.

Strangely enough in schools today the first and fourth stages have received greater considerations at the moment. Educationists have shown their optimism in formulating higher objectives and devoting more time and energy to construction of tests. But the basic condition, namely, the learning situation, has yet to be improved and the methods of instructions reoriented.

While drawing out a plan for educational guidance one should not forget that the testing programme in a given school should be designed to meet the needs of that particular school, and a school system should plan in terms of the total testing programme in order to provide the necessary sequence and co-ordination of the various tests. In many smaller schools where the number of pupils is small and the contact between the teacher and the pupils is closer, the need for testing is not so essential. It should be remembered that tests are means to an end and they involve much labour, and demand skill and accuracy.

The interpretation of the tests scores is really the most difficult job and much depends upon the recording and arrangement of the scores as well as proper maintenance of individual schools records.

RECORDING TESTS SCORES AND THE USE OF CUMULATIVE RECORD FOR GUIDANCE

A Cumulative Record Card should serve as a mirror for presenting a complete picture of a pupil's all-round progress over a number of years as well as an idea of the development of one's interests, aptitudes, personality traits, etc. In short it should contain a comprehensive and continuous record of the total growth of the child and all relevant information pertaining to him. It is thus one of the effective documents for implementing guidance scheme on a co-operative basis.

Characteristics of a Cumulative Record Card are as follows:

(*a*) It is a confidential record of a pupil meant for individual help.
(*b*) It is a systematic and gradual collection of finalized and objective data.
(*c*) It is a simple but accurate device for keeping the history of a child in respect of health, and some scholarship and other attainments.
(*d*) Every effective record card should be accompanied by necessary directions.
(*e*) It is different from the traditional progress report containing only incomplete data about the child's attainments.
(*f*) It is a means of understanding the individual in order to help the pupil to understand himself and to improve his learning capacity.
(*g*) It should be easy to read and easy to reproduce quickly and cheaply.

THE CUMULATIVE RECORD CARD—ITS CONTENTS AND USE

A. General Principles of Data Collection.

(*i*) Any information which has a bearing on the pupil's growth and developments has to be included.
(*ii*) Item of data should change according to the changing needs of the school. They should also change according to the changes that

take place within the individual at important stages of his growth, for example, the transition from childhood to adolescence.

(*iii*) The amount of information to be collected on different aspects of the child's personality make-up should not exceed the possibility of its actual use.

(*iv*) Data should be gathered from all the laboratories of the school classroom, home and community (wherever possible).

(*v*) It should grow directly out of the needs of pupils and should be used to meet them.

(*vi*) It should be a unified and not unrelated bits of information.

(*vii*) It should be enriched with data gathered through many other means.

B. Classification of pupil's data and its importance.

(*i*) General information : Name of the pupil, father's name, admission date, date of birth, class and section, etc., should be included. This helps easy location of the card of each individual and may also be used for other purposes.

(*ii*) Environment and Background data : Home, neighbourhood, influence of socio-economic status of the family, cultural status of the family, specific emotional relations at home such as parent-to-parent relationship, parent-to-child relationship, child-to-child relationship, etc., should appear on the card. The influences determine to a large extent almost all the aspects of pupil's growth, especially emotional and social.

(*iii*) Mental data: These constitute the mental equipment of the child which forms the starting point of development. How much of it will be used depends upon the environment that we provide for the child. The limits of growth are, however, determined by the innate capacity of the child.

(*iv*) Achievement data: It should include pupil's scores in different subjects of study. If carefully ascertained, these show to what extent effective use of mental abilities is being made.

(*v*) Psychological data : Personality qualities, emotional and social adjustment, attitudes and interests, etc., should comprise psychological data. These determine the quality of the pupil's behaviour and also indicate the nature and direction of his later growth.

(*vi*) Social data : It should present a picture of child's participation in various social and cultural activities such as games, clubs and other community activities. These help to define the pupil's functioning interests and give an indication of the type of work in which he will engage himself in later life.

(*vii*) Other data will present out-of-school experiences, educational and vocational plans, work experiences, study skills, work habits and also the aspirations. Though classed as miscellaneous information on these points is necessary because it helps to make the work of educational and vocational guidance more realistic.

The following are the situations in which Records are needed.

1. Periodic Appraisal of Pupils : To see trends in pupil's development, progress made and help needed.

2. Choice and Crisis: (*a*) Choice of course or change of course. (*b*) Choice of activities within the class and choice of student's activities in school and outside. (*c*) Choice of vocational field. (*d*) Some crisis in child's life.

3. Parent Conferences: (*a*) Parent-Teacher conferences on child's progress for making reports to parents. (*b*) To gather information from parents for records.

4. Help in Problems of Adjustment : (*a*) Clues to causes for behaviour or discipline problems. (*b*) Social adjustment in groups. (*c*) Problem of failure in school work. (*d*) Problem of truancy and delinquency. (*e*) Adjustment to family. (*f*) Understanding newly-transferred students.

5. Planning and Individualizing Instructional Activities: (*a*) Adaptation of lesson-contents to interests, hobbies, etc. (*b*) Recording the relationship of personality development to mental achievement.

What to look for in Records

1. Relationship discrepancies, trends, sudden changes in health, failure or low achievement in class work, social status and personality trends.
2. Area of the best and weakest work.
3. Whether students are growing and changing.
4. Data for making studies around certain problems. (*a*) Why is there such a high percentage of absence among a section of the students? (*b*) What is the achievement of pupils who drop out of school?

Possible Dangers: (1) Too much generalization. (2) Influence from previous impression of pupils. (3) Bias of persons recording. (4) Free use of confidential material (confidential material should be kept separately from regular cumulative record).

The Secondary Education Commission suggested that the pupils' attainments should not be regarded as the only data, but other important aspects of the personality should be taken into consideration while evaluating the total progress of a child. All-India Council for Secondary Education, set up by the Ministry of Education, has thoroughly examined the issue, and suggested the introduction and maintenance of cumulative record cards for the purpose of effective evaluation. A lot of confusion still prevails in the minds of many teachers and heads of secondary schools. Some of these doubts and confusions have no doubt some basis but quite a lot of them can be clarified if the problem is faced with an open mind.

Among the items included in the cumulative record card, the items on interest and personality assessment deserve special mention because of their importance in the guidance programme. Besides the assessment of personality, interest demands special care and skill on the part of the teachers and counsellors. At present when standardized tests are very rare in our country, the teachers will have to depend mainly upon observation for collecting data. It is a fact that observation as a technique suffers from subjectivity particularly in the hands of the untrained persons. At the same time the persons entrusted with this may do a good job if it is planned and systematic. Various suggestions may be given for doing justice to this work even in the present circumstances. In this connection it may be mentioned that different study circles and seminars are being organized now and then for meeting the problems faced by the teachers. In the light of the discussions in those meetings, it appears that much depends upon the co-operation and co-ordination between guardians, heads of the institutions, teachers and persons involved in educational administration and planning.

Means suggested for finding out this Specific Interest of Students

As observation is to be depended upon, it must have a broad basis but unfortunately the school situation is too narrow to provide ample scope for objective observation on all the desirable traits. It is, therefore, advisable to create certain situations and provide opportunity for projection, either in class-rooms or in activities organized outside class and school. It is true that the same person may have a number of interests but generally everyone should have preferences in various degrees. One may have some interest in fine arts but very keen interest in science. The concern of the educationalist is to create as many situations as possible so that the student can be observed and his reaction in specific situation recorded.

Among the seven streams introduced in the multipurpose schools in India, everyone has no psychological significance. Most of them are based on sociological needs. As such, there is a good deal of overlapping in respect of these arbitrary classifications. Still there are some streams like technology and fine arts, where the interest can be more easily observed. But scientific and technical interests appear to be overlapping to a great extent. Similarly interest in agriculture is hardly distinguishable because of the fact that most of the students are interested in gardening. So far as the interest in commerce is concerned, it is extremely difficult to take into account the characteristic comprising commercial interest.

There are certain general means which may be more or less adopted for the detection of every type of interest. Activities may be organized in the class-room, or outside class-rooms and even outside school.

In the class-room the following lines of action may be adopted.

The teacher should try to know the child through his response to the questions, etc., and exercises done in the class. Special exploratory activities may be organized in different subject areas. The Cumulative Record Card as mentioned before may contain a variety of items and as such no rigid form should be prescribed. The form may vary from school to school according to local conditions. But, a sample may serve a useful purpose at the moment when everything is in a state of transition. As will be observed, there are certain different heads comprising the card suggested by the Secondary Board of Education, West Bengal. The items included are:

1. Health Record.
2. Position of Responsibility held in school and awards obtained.
3. Interest.
4. School achievement.
5. Co-curricular activities.
6. Personality.
7. Other information.

On an analysis of these items, it will be obvious that the purpose of the card is to identify and to locate the child. In this connection it may be suggested that the value of the card will be enriched if accompanied by a photograph of the child. Thus the different items on health, school achievement, co-curricular activities, personality, etc., have some significance, if judged from the standpoint of utility. But it is very difficult to say whether this is all what we want. Theoretically, there is a justification for the incorporation of the items mentioned above.

Health Record. This record has to be kept in co-operation with medical experts and the medical inspection should be frequent and regular so as to detect any physical weakness or ailment without much delay. Unfortunately, in most of our schools the arrangement for medical inspection is not adequate. And unless it becomes a part and parcel of the school programme, the purpose of including this item will not be served. At the moment there are many schools in villages where a really qualified doctor rarely visits the schools.

Position and Responsibility held in School and Awards, etc. obtained. This item has perhaps been included mainly for throwing some light on the personality of the child. It is supposed that the students, who hold important position like that of monitor, captain in the corporate life of the school, have some qualities like initiative and leadership. But the use of this column will be very limited, as negligible section of the students takes such initiative and holds important position in the corporate life of the school. The scope of the item has got to be widened and this may therefore, be well combined with some other broad heads.

Interest. This item is of high significance so far as the problem of educational or vocational guidance is concerned. But it is really difficult to find out practical means and methods and for properly filling up this column. Nobody will oppose the view that a sudden change in the school programme is hardly possible. So practical means and methods have to be evolved in the existing circumstances. As tests are very rare, it would be wise to depend upon observation to a great extent and this may be done through activities organized in the class-room or outside the class-room.

Among the activities to be organized in the class-room, the daily exercises and other responses to the questions may indicate the field of interest to a certain extent. One's interest may be observed :

(*a*) through the daily exercises done in class, both written and oral,
(*b*) special exploratory activities relating to the subject may also be helpful for the purpose of observation. Students may be allowed to choose books in the library period and the books may indicate their preferences.

Thus it is clear that the co-operation of the librarian as well as that of all other members of the staff is essential to make this collection of data a success. Besides the activities to be organized in the class-room, other types of co-curricular activities such as exhibitions, excursions and recreational activities may be introduced for widening the scope for projection of students. They may be encouraged to keep diaries and different activities like debate may also be of some value. Question-box may also be introduced for inviting questions on different subjects. The nature of the question and the subject area will indicate their interest or inquisitiveness. It is clear that there should be a fair scope for displaying the students' interest even outside school. The students may also have some scrap-books of their own. They will be encouraged to fill up these books in their own way. Hobby clubs may also be started by the students who can participate in respective field according to their choice.

As interest in a particular subject depends upon the ego-involvement of a student, it is not easy to ensure the motivation because of unfavourable circumstances. Moreover, the level of motivation varies according to the personality make-up of the individuals. There are some who are imaginative in nature, highly emotional and sensitive to subtlety of expression. On the other hand, there are individuals who have got practical wit and who are lovers of details, keen observers and more systematic in their approach.

The former group appears to have an artistic bent of mind, whereas the latter seems to be more interested in science. Thus the distinguishing characteristic of every type of students having dominant interest in one specific field may be discovered for guidance.

School Achievement. This item received the sole attention of the educationist in previous years, and the progress report traditionally maintained so long contained nothing but academic records. But the record will not give a comprehensive picture of the progress or development of the child. With a view to making this record more systematic and elaborate, the present columns have been suggested in the Cumulative Record Card. Under this column the highest and lowest marks along with rank in each subject should be incorporated. The number of pupils in each class should also be indicated. The isolated marks without any other data for comparison are of little help. For the present these numerical estimates are still regarded as essential data, though examination of the system may reveal the futility of such quantitative measurements. It would be thus desirable to replace this numerical estimate by qualitative measurements, on the point scale.

Co-curricular Activities. The concept of co-curricular activities is no doubt a recent development and it has been regarded as one linked to the curriculum. Among the different activities under purview, the following deserve special mention.

(*i*) Games and Sports.—The purpose of introducing games and sports is mainly recreational, though the activities also aim at the development of the body. In most of the schools, particularly in towns, outdoor games cannot be provided for want of sufficient space and initiative on the part of the teachers or school authorities. It is very difficult to rate here as both interest and performance are involved in the matter. So the quality of play, the zeal shown by the participants should form an important criterion, besides the number of games played.

(*ii*) Intellectual and Literary.—Though such activities have some recreational value they mainly serve the purpose of developing the child's power of thinking, reasoning, understanding and problem-solving. The other games of intellectual and literary nature are those demanding expression of ideas into language. For example, debates, editing wall-magazines, story building by pictures, etc., may be organized and the class may be divided into various groups for the proper execution of all these types of co-curricular activities. There can be no hard and fast rule for rating in this field but for the sake of convenience and uniformity of procedure certain agreed principle should be arrived at. For example, students successfully participating in four or more items, out of the above may be rated as above average, whereas the very reluctant participants may be placed in the lower point of the scale.

(*iii*) Recreational.—Besides the above types of co-curricular activities, there are purely recreational activities which stimulate and invigorate the body and the mind. For example, drama, variety programme, excursion, picnic and such other performances help to a great extent the stimulation of the mind.

The principle of rating in this case may be similar and the class teacher in co-operation with others should arrive at an agreed rating.

(*iv*) Social.—Lastly, the co-curricular activities may be so designed as to help the children to come in closer contact with society and thereby to develop in themselves social consciousness. The activities which directly or indirectly contribute to the welfare of the society may be organized. For example, the students may be entrusted with activities like helping the poor, nursing the sick, organizing library and reading room or improving the sanitary condition of the locality. Rating in this connection should be guided by different considerations. For this purpose information may be gathered through various sources, and attempt should be made to rate in all cases at least twice a year. Besides, personal interviews with pupils may be evolved. The students may also be asked to keep personal diaries filled up on day-to-day basis.

Personality.—Assessment of personality is one of the outstanding problems and perhaps the most difficult part of the Cumulative Record Card. There are different items under the head "personality" and it is worthwhile to define each and every personality trait included in the card. The concept of each trait should be made clear before the teachers are entrusted with ratings.

(*i*) Initiative.—This is a quality which helps one to come forward to take up responsibility, to offer new ideas and contribute something original. The term implies a positive virtue by which one can undertake work out of his own. Thus it is an asset contributing to the success in one's life. The negative side of this trait may also be mentioned for the clarification of the concept. It means that when trait is absent, it keeps one lagging behind and makes him follow others meekly.

(*ii*) Industry.—It is one of the traits which is most desirable in one's personality. It makes one hard working and persevering and help him to take necessary actions for any new venture. With the help of this quality one becomes persevering, diligent and earnest. A person without industry is therefore, idle and disinterested in any work.

(*iii*) Responsibility.—It is very doubtful whether there is such a trait in the personality structure. It is no doubt a quality which enables one to follow up a work scrupulously and sincerely. The negative aspect of this trait means carelessness, indifference and half-heartedness.

(*iv*) Co-operativeness.—This is one of the most desirable personality traits for the development of the child-life. It enables one to do a work together and share experience with others. In order to be worthy citizen one must be sociable by nature and sociability is possible only if one has developed the co-operative attitude which may be observed through any group activity including games and such other co-curricular work.

(*v*) Emotional Balance—The person who is not affiliated with high-flown sentiment and who does not lose temper is easily one having what is called emotional balance. It measures steadiness and consistency of behaviour. The opposite aspect of this trait is high irritability and lack of optimistic outlook. The people without emotional balance suffer from depression and unnecessary conflict. Thus this personality trait has got a bearing on vocational and educational guidance. It is very difficult no doubt to observe and rate this trait through class-room activities. It would be, therefore, advisable to create certain situations demanding this quality. For example, debates, competitive games and activities involving self-government in school may be utilised for the purpose.

(*vi*) Self-confidence.—As regards this quality it has been experienced by many that self-confidence is a trait very difficult to be rated because of its overlapping with other traits. The person having self-confidence works with conviction and steadfastness. On the other hand, anybody without this quality feels helpless and shaky. More or less such people are apprehensive by nature and very conscious of what others are thinking about him. This is highly inert and is only evident through situational provocation. It is realized that without this trait no amount of intelligence will be of much help in the practical field of attainment. The determination of the ways of rating this trait is indeed a problem. Like the other traits this one belongs to non-conative sphere and is hardly expressed or manifested in ordinary situation of life.

(*vii*) Work-habits.—Work habits include one's ordinary ways of life. There are persons who are systematic and others who are not. Similarly, neatness or tidiness, punctuality, carefulness and such other aspects of behaviour happened to be the distinguishing characteristic of some persons, whereas the negative aspects of these traits are found to be prominent in some other people. These habits manifest themselves through their activities, and it is the duty of the school to mark these habits on different occasions in school or outside school. Home assignments class works and co-curricular activities like preparing the scrap book and editing of the wall-magazine may throw some light on this area.

(*viii*) Any other trait.—Like the traits already described there may be other personality tests as well which have some importance in guidance. For example, persistence, fluency, level of aspiration appear to be highly co-related with attainments. Unfortunately some of these important traits have been left out. The importance of persistence has been highly recognized by psychologists like Vernon and others. It goes without saying that the person who is persistent carries on the work without caring much for the hindrance.

Other Information.—There are other problems regarding the nature of the behaviour. Sometimes the students are boastful. There is a lack of initiative. Sometimes they are untidy, timid, aggressive and shy. They become easily irritable and are sometimes persistent in misbehaving. There are other drawbacks also such as selfishness, deceitfulness, extreme dependence and unmindfulness. Sometimes the children suffer from a propensity for lying, stealing and nervousness.

The inclinations and aptitudes of pupils can be evaluated from their hobby, co-curricular activities, class library and marks obtained in different subjects. For this purpose special kind of questions must be set.

It is almost impossible to prescribe a definite vocation of life on the basis of the scanty information about the pupil. At the same time, it is true that there is hardly any co-ordination between schools and employers. Still it would be advisable to utilize the records during the school days, and suggest the vocation which appears to be the most profitable and suitable to a person. How can this basis be found out? For this purpose information has to be gathered from different sources. Some ideas can be formed from his participation in the kinds of craft, the information being taken from the teachers responsible for teaching subjects like literature, crafts, arts, science, domestics, social studies, games and sports.

PLACE OF OBJECTIVE TEST IN EVALUATION PROGRAMME

Reform of examination has brought about a change in the nature of questions.

The objective-type examination represents an attempt to eliminate the limitations of the traditional essay-type examinations. The outstanding merits of the new type of examination are as follows.

It is not influenced by the idiosyncrasies of examiners as it tries to have all answers to the questions either right or wrong. It also attempts to draw up clear-cut directions so that there can be no scope for misunderstanding or confusion.

The new type of examination also tries to simplify the scoring principle by avoiding the disturbing factors, namely quality of handwriting, tidiness, etc.

But in spite of its merits, objective test has its shortcomings. One also wonders as to whether the new-type examination is fully objective in the true sense of the term. So far as scoring principle is concerned the new type may be objective but as regards the framing of the questions there is still scope for subjectivity.

Besides, objectivity is meaningless, if it sacrifices many objectives of a true evaluation.

The characteristics of the old and new-type tests may be analysed and summed up as follows.

1. (*a*) The essay type of tests consists of a small number of questions

requiring large answers. The examinees are generally asked some five or six questions in a paper of 100 full marks, but each of these questions entails so very elaborate an answer that even after writing several pages the examinee hardly has chance of satisfying the examiner who is almost always reluctant to give full credit to him in such tests.

(*b*) The objective type of tests consists of a large number of questions requiring short and pointed answers. The answer to each of these questions is so very short that it may be written in a word or two or at most in a sentence.

2. (*a*) Essay-type questions are usually broad, general and indefinite inasmuch as the examinees are at a loss to know how much they will have to write as answers.

(*b*) Objective questions are special, narrow and definite.

3. (*a*) In essay-type tests marking is subjective, depending upon the personal equation, bias, temperament, whims, etc., of the examiner.

(*b*) In the new type of tests, scoring is objective. There is no provision for partial credit, that is an answer must either be right or wrong and hence full or no credit.

4. (*a*) The answers are long and hence the test is tedious both to the examinee and to the examiner. There can be room for bias and favouritism in marking and the examiner has to devote a long time in examining.

(*b*) Questions can be answered in a short time, hence it is economical to introduce such tests. Moreover there is no room for bias or favouritism in marking.

5. (*a*) Questions are selected at random, that is whatever occurs in the mind of the examiner at the moment of framing the questions is generally set. In such cases some of the most important questions or chapters may be ignored, and hence proper justice is not done. In such a type the entire course cannot be covered.

(*b*) By comprehensive questions the entire course may be covered.

6. (*a*) It puts premium on expression, that is the student hardly finds any time to think over the question as he has to write a long answer and the time allotted is not generally found sufficient.

(*b*) It puts premium on thinking that is the student finds time to think over the question as the answer is short.

7. (*a*) It is an advantage to bookish pupils having linguistic skill.

(*b*) It is advantageous to the intellectually smart students, as there are some 150 or 200 questions to be answered in half an hour, and, therefore, it is disadvantageous to those who are slow.

8. (*a*) It takes a short time to frame questions.

(*b*) It takes a long time to frame questions—framing of questions can be best done daily from day-to-day teaching.

9. (*a*) Students find it easier to prepare, particularly those who have no

ambition other than to score pass marks. Boys can safely omit the more difficult chapters intelligently and tactfully because of the alternative questions which are always set by the examiner to give the majority a scope to pass. Boys can get through the examination simply by memorization, without having any clear conception.

(*b*) Students have to devote a longer time to preparation as they have to go through the entire course for clear conceptions.

10. (*a*) It is very suitable for testing composition skill and knowledge of the subject. As both of these are most essential, essay-type still has the supremacy.

(*b*) It is not suitable for testing composition skill as well as appreciation of the subject and this is the greatest drawback of this system.

11. (*a*) There is scope for guessing the questions that are to be set and hence most of the boys without going through the "Texts" proper, prepare themselves by reading only "Made Easy" and "Short time preparation" series that flood the market.

(*b*) There is not such scope for "Made Easy" preparations, but there is scope for guessing answers.

12. (*a*) It requires a long time to examine the answer scripts.

(*b*) It takes less time to examine the answer script.

13. (*a*) Questions in this system are short and the number of questions is also small. Hence printing cost is small but as the answers are long, answer scripts cost much.

(*b*) There are many questions and hence printing is costly but as the answers are short, they can be written in the question paper itself and do not usually require separate answer books.

14. (*a*) The examinee may conceal his ignorance of the topic by answering in such a manner as to evade the points.

(*b*) No such possibility exists in the new type.

15. (*a*) The boy gives answers around the question. Hence in marking, the student is often penalized for either short or long answers.

(*b*) The boy gives his answers on the questions and hence, there is no scope for student being penalized for nothing.

16. (*a*) There is less scope for adopting unfair means by the students in the examination hall.

(*b*) There is enough scope for adopting unfair means.

Thus the construction of new type tests demands skill and insight into the subject matter. There are, however, various forms of new-type tests which may be broadly classified under two heads:

(*i*) Recognition-type
(*ii*) Recall-type.

The recognition-type gives much scope for guess-work and is thus subject to criticism.

There are many common forms of tests which are given in the Appendix.

(*a*) For Essay Type tests.
(*b*) For New Type tests.

CHAPTER EIGHTEEN

Procedure of Educational Guidance

WHILE drawing up a plan for educational guidance, one should bear in mind that the testing programme in a given school be designed to meet the needs of that particular school.

There are various steps which should be taken for effecting a guidance programme. As no programme is complete without a systematic approach the following aspects have been suggested :

(*a*) Organization of the guidance service.
(*b*) Taking psychological approach to guidance.
(*c*) Taking sociological approach to guidance.

ORGANIZATION OF THE GUIDANCE SERVICE

The need for guidance has been admitted on all hands but many people still fight shy of facing so many outstanding difficulties on the way to the implementation of the programme. This is mainly because of the lack of organization and proper co-ordination.

With a view to organizing the various activities involved in guidance, a number of objectives should be formulated. Everyone interested in the matter must have a clear idea of what is to be done. As mentioned before, the guidance is a co-operative job and everything depends upon the extent of co-operation available. There should be one to co-ordinate the activities of the different members. In other words, the joint efforts of the headmaster and other members of the staff are required for a successful programme. The teacher-counsellor has undoubtedly a certain definite function. There are different sources which should be exploited. The teachers, headmaster, counsellor and guardians must co-operate in order to make the total programme effective. Some are to collect the data from various sources, some are to record them and arrange in a systematic manner, while others should help to maintain the records properly. So an effective programme demands not only human resources but also space and time.

FUNCTION OF A TEACHER-COUNSELLOR

In the guidance programme, the function of a teacher-counsellor deserves special mention. A teacher-counsellor in short should have a number of functions besides described :

(*i*) Recording information about individual students.
(*ii*) The interpretation of scores.
(*iii*) Giving occupational information.
(*iv*) Preparing a guidance schedule and counselling.
(*v*) Organizing guidance programme.

(*i*) *Recording Information about Individual Students.* As discussed before, observation, rating scales, autobiographies and sociometric device may be employed for collecting data about individuals for the purpose of guidance. In securing information, the teacher-counsellor should ask the other members of the school to employ not only observational techniques but also avail themselves of autobiographies, if possible. An all-school testing programme may be organized for the purpose.

The Role of Cumulative Records.—No single test score can be entirely depended upon as it may be misleading. Scores should, therefore, be related to and compared with other scores of the individual. But the collection and comparison of a variety of scores and information will be meaningful only if they are carefully and systematically accumulated. This can best be done through proper maintenance of cumulative records. In planning a cumulative records each teacher-counsellor should make sure that every student's record covers the minimum essentials. The record cards should be kept up to date by regular entries in collaboration with others.

(*ii*) *Interpretation of Scores.* Test scores are means to an end and much depends upon how they are interpreted and used. The teacher-counsellor should be conversant with the statistical procedure and its limitations. Test scores acquire meaning only after they have been organized in some usable form. It appears to be advisable, therefore, to put the data graphically or prepare profiles for facilitating interpretation.

(*iii*) *Giving Occupational Information.* Modern occupational world has become very complex with increasing degree of industrialization and consequent specialization of fields. The need for understanding the type of work is therefore very great. The trainees should be provided with accurate usable information about jobs, industries, work processes, employment trends and opportunities. A few items, namely duties of workers, their chief personal qualities required and their preparation, average income, etc., should be included in occupational information. Occupations should be classified into a smaller number of groups, according to one's salary, educational requirements, etc.

Some subjects may be taught in such a way that through their study trainees may have an idea about the different jobs that are connected with those subjects and may establish a relationship with a particular occupation which, he thinks, is most suitable for him. Moreover, books and other publications of reliable agencies through which trainees may obtain occupational information should be fully utilized by the teacher-counsellor and there must be an exact and concise statement on how the work is done by the worker and what is required of him in terms of knowledge skill and aptitude for performing the work. There are publications of career pamphlets called "Guide to Careers". These, if wisely used, will be of great value to the trainer.

(*iv*) *Preparing a Guidance Schedule.* One of the practical steps to be adopted for effective counselling is the preparation of a Guidance Schedule which should be more or less in the form of an abstract, covering different areas of the individual's attainment. Generally, the schedule is prepared after the rough calculations are made into final or standard one.

"Guidance Schedule" should be a precise account of the individual either graphically or by means of condensed charts. The function of a teacher-counsellor is, therefore, to prepare and maintain such a "Guidance Schedule" for ready reference.

What Guidance Schedule should contain.—For the purpose of assessment of the mental abilities of the pupils, psychological tests are considered to be very valuable. The abilities which can be measured with the help of these tests are general intelligence, abilities, interests and aptitudes. From the result of these tests the future career of the pupil may be predicted, but too much dependence on test results is not desirable at present, because standardized tests are not yet available in our country. A high level of general intelligence is required in some other occupations. These are to be correctly assessed as proper guidance cannot be given without this information.

Measurement of personality is a very knotty problem, as in our country no test has yet been used in this field. We can, however, have an idea of the pupil's personality if we observe his behaviour in the class-room, library, playground, etc., record these properly and make an interpretation thereof. In this connection it should be remembered that this rating should not be influenced by personal equations, that is, raters' likes and dislikes. If with the help of other teachers and parents rating is done carefully, we can have a glimpse of the personality of the pupil.

Interest of the pupil may be assessed through questionnaire and other types of tests (given in the Appendix). But considerable skill and care are required for framing a good questionnaire. The interest of the pupil is one of the important sources of pupil data, because a pupil may be easily motivated in certain line if he is really interested in it. In this respect the teacher-counsellor may collect very valuable information about the pupil from his parents and neighbours.

School Achievement—School achievements in curricular subjects are usually considered as important indicators of future accomplishments of the pupils. They also indicate the trend of their interests by showing their comparative standing in the various subjects. But the present system of examination should not be the only method of measuring the attainments of the pupils. One of its disadvantages is that it gives undue weight to one's power of expression in which so many individual differences exist. In order to reduce the element of subjectivity of the essay type tests and objective tests of attainment should be widely introduced side by side.

Tests should be, as far as possible, objective, valid and reliable. Otherwise, correct assessment of pupils' achievements is not possible. Framing of objective tests is undoubtedly a very difficult job. At present *ad hoc* objective tests may be framed and taken. But utmost care must be taken to frame the questions so that the test may correctly measure the attainments of pupils in the particular field.

The final assessment of the pupil, however, should not be based entirely on the result of these tests, for they cannot give a correct and complete picture of a pupil's all-round progress at any particular stage of his education. Yet it is important for us to assess this progress in order to determine his future course of study or his future vocation. For this purpose, Cumulative Record Card should be maintained for every pupil indicating the work done by him in the school from day to day, from month to month, from term to term, from year to year. Such a school record will present a clear and continuous statement of the attainments of the child in different intellectual pursuits throughout the successive stages of his education. It will also contain a progressive evaluation of development in other directions of no less importance, such as the growth of his interests, aptitudes and personality traits, his social adjustments, and the practical social activities in which he takes part. In other words, it will give a complete picture of the pupil. This record card should be introduced in class VI and will continue till the pupil leaves school. It should be confidential, and in case of transfer of the pupil, the record card should be sent to the new school, so that the authorities of that school may plan the future course and career of the pupil.

Counselling—As counselling can neither be non-directive nor directive, it should therefore always be elective. In the matter of counselling the first and foremost thing is to unnderstand the problems of the child. In this respect it is the primary duty of the teacher to establish rapport so that the subject may open his mind to the counsellor. The counsellor must create a sense of security in the pupil's mind so that he may express everything to the counsellor. Without proper understanding of the real problem of the pupil counselling is absolutely impossible. The process of vocational guidance includes the task of acquiring from the individual a wide range of information concerning himself as well as the various occupations. Thus vocational guidance and education guidance go hand in hand. Educational guidance becomes more meaningful by keeping an eye on the future vocational role of the pupils.

(v) *The Organization of Educational and Vocational Guidance in Schools.* The joint efforts of the headmaster, other members of the staff and the teacher-counsellor are required for a successful programme of educational and vocational guidance in school. The teacher-counsellor has undoubtedly certain definite functions in guidance but unless the headmaster provides for the development of favourable conditions for the entire staff to participate in the guidance programme, the career-master cannot do much in this respect. To assess the innate potentiality of the pupils, to disseminate information about the occupational opportunities and to modify certain attitudes of the pupils a co-operative effort of the teachers and parents is essential. To achieve these purposes, psychological tests and organization of visual aids are necessary. Visual aids like models, pictures, diagrams, charts, etc., should be prepared and exhibited to inform the pupils of different avenues that are open to them so that they may select one of them according to their ability, interest and aptitude.

At the present moment, emphasis should be laid on curricular guidance in view of the fact that the Secondary Educational Commission (1952) recommended diversified courses at the end of the Junior Secondary stage. This scheme of multipurpose schools with diversified courses of instructions, imposes on the school authorities the additional responsibility of giving proper guidance to pupils in their choice of courses and careers.

The two main steps in organizing a guidance programme is to set up a committee representing every section of population concerned with or interested in guidance.

The line of work of the committee should be as follows:

1. To survey the student's needs.
2. To survey the interest and ability in guidance work of the members of the staff of the institutions.
3. To arrange for initiating a follow-up programme.
4. To organize different conferences of parents, teachers, employment authorities and the public.
5. To give publicity to the guidance activities for making the public guidance-minded.
6. To offer adequate opportunities for training in guidance to the teacher and encourage them to make use of their training by minimizing or providing additional remuneration.

CHAPTER NINETEEN

Occupational Information

IN MODERN society the scope for adjustment of human resources to the occupational world is increasing. The overwhelming majority of the people are engaged in a specific, relatively continuous activity in order to earn their livelihood and maintain a definite social status. This activity is called occupation.

Our modern culture believes in the right of the individual to choose his work. It also believes in a high degree of specialization. Occupational choice affects both the individual and the society.

There are two aspects of individual freedom of occupational choice. The one relates to the individual seeking his place in the range of opportunities which confronts him, and the other relates to society. Certain occupations and professions must be stopped in order that the health and welfare of the society be safeguarded. With a view to organizing an adequate guidance programme, occupational information should be catered from the early stages. Everyone should have the knowledge of occupational pattern and trends in the community. There should also be arrangement for disseminating information about community resources and occupational opportunities. Information about industries and training facilities is also very useful to the students for an effective guidance. In the words of Ginsber, "Because the occupational-choice process is tied so closely to the general maturation of personality, considerations must be given to the sequential changes—physical, emotional, intellectual and social that occur during the critical years of adolescence." The ultimate objective of the occupational information services is to encourage its use by students, teachers and counsellors. In order to fulfil the aims, the service should be regulated by the following principles:

1. All materials should be readily accessible to all concerned.
2. This should be available for either home or class-room use. If occupational information is to be used in a class-room, it can conveniently be distributed, and collected widely.

Thus, there are group method and individual methods. It is worthwhile to mention in this connection that the process of occupational choice determination cannot be done without recourse to psychological postulates that help to explain human behaviour. The interplay of individual and society is to be recognized. So the theory of occupational choice determination is still developing.

There are individual differences, and it is the function of the State to detect these differences for their proper utilization. On the one hand there is man-power while on the other there is the field of industry and vocation. There should be a harmonious combination of the two. The students, even at the early stages of education, should be aware of the avenues awaiting them. In other words, the world of occupation should be brought to the knowledge of the young learners from a suitable age. The çounsellor, therefore, should have at least a general understanding of the world of vocation. If he is familiar with the sources of occupational information he can ascertain the detailed facts according to need. When the teacher-counsellor has acquired some understanding of the nature of work performed in a particular occupation, he may be ready to explore the personality of the individuals. The occupational information includes perhaps the nature of the work, occupational relationships and the working conditions. The information on the nature of the work has reference to occupational titles, occupational definitions, activities of workers, machines, tools, apparatus and materials used. Such information is obtained through job analysis. In order to ensure a closer co-ordination between the requirements of the occupation on the one hand and the individual potentialities on the other, it would be advisable to study the personal requirements—mental aptitude and special ability, character and personality. Much progress has been made in developing techniques for occupational research. The demand for an occupation has to depend upon a number of factors. The most important of these are economic conditions, trends in population growth, technological changes, changes in tastes and styles and habits of the people.

When the counselled student has acquired some understanding of the nature of the work performed in a particular occupation, he may be ready to assess his qualification for such a career. This indicates the necessity for a close co-ordination between the requirements of the occupation on the one hand and the individual potentialities on the other. To study the personal requirements for success in occupations is one of the areas of psychology requiring greater attention. There should be an attempt to study the psychological aspects of an occupation and personality traits required for specific occupation. For example, the level of intelligence required of workers in different occupations is an important factor in a vocational choice. This fact led to a comprehensive study of the different intelligence level required for different occupations. Minnesota occupational rating scale represents still another noteworthy development in the grouping of occupation according to the level of intelligence.

Different types of information should be made available for occupational guidance, e.g., information about (1) occupational requirements (2) economic information about occupation (3) the social value attached to each occupation (4) the Industrial structure, etc.

Use of Information Counselling Service—Occupational information is usually recognized as one of the essential tools in the counselling process. They have got different uses. The counsellor should decide in every case whether occupational information is the real need of the pupils. He should also decide which materials are appropriate to the pupils' experiences and reading ability. The other question arises as to how much assistance can the counsellor give the pupils in the use of occupational information. As the counselling process should involve learning experience, the counsellor should give only that amount of assistance which best helps the counsellee to become self-directive. Though the counsellor recognizes the difficulty to evaluate the occupational information, still the evaluation should form an indispensable part of counselling. In India, the guidance movement is a recent development and thus needs publicity. Information can be disseminated through career conferences, hand books, clubs, publications, field trips and regular classes. The outstanding difficulties are many and the local problems are varied.

The occupational information may be obtained from different sources and it is perhaps desirable to conduct community occupational surveys, because the occupational information service is one of the necessary tools in the vocational adjustments of the students. This service is essential in guidance programme. The use of such information in counselling interviews always involves the question whether the pupils are ready for the information in the vocational planning area or not. The counsellor tries to help them to develop an understanding of his interests, aptitudes and other traits. The use of such informations should be evaluated in terms of its effect.

Information through clubs, field trips, publications, audio-visual aids and regular classes prove very helpful. Group methods of presenting occupational information which include both curricular and co-curricular activities are helpful to students.

In short, sources of such informations may be different like community, society, state, persons and employment agencies.

Provisions for the Use of Occupational Information.—The ultimate objectives of the occupational information service is to advance its use by students, teachers and counsellors. In order to fulfil the aims, the service should be regulated by certain principles. First, all materials should be readily accessible to all concerned. Second, they should be obtainable for either home or class-room use. If occupational information is to be used in class room it can be conveniently distributed and collected by means of a mobile library. There are other devices like wall papers or guidance corners where suitable occupational information can be displayed. Thus much depends upon the conditions for catering this information to the needs of the pupils. For all students of a school the occupational information can be of adequate use. Besides, through group methods students gain individuality. The group instructional activities have, of course, a number of values. They are:

1. Orientation can be given to all students.
2. Individuals in need of counselling can be discovered.
3. The demand for counselling services can be increased.
4. Report for subsequent counselling can be established.
5. Information of common interest and value can be economically imparted.
6. A more effective means of imparting certain kinds of information can be used.
7. Self evaluation can be fostered.
8. Positive personal attitudes and traits can be developed.
9. Experiences of a number of individuals can be pooled for the benefit of each member of the group.

The use of occupational information in group activity and its use in counselling have been confused. It has been found out that counselling interviews supplemented by group activities prove very effective, and economical too, in conveying occupational information to students.

There should be students' participation in planning programmes of group activities which are centred around the use of occupational information. Group activities should make use of occupational development of the students. Such activities also aid the teacher and the student to co-ordinate their motives. This type of service has got many utilities: (*a*) it may be used to arouse the interest of students in guidance services (*b*) it may provide students with many types of information (*c*) it may direct students to sources of further assistance.

For India the data on occupational distribution show that a considerable change in the social and economical structure has taken place. The Planning Commission has rightly pointed out that the problem is to prevent too rapid technological unemployment. As a result, that task of creating new employment has to be visualized. It has also to be borne in mind that the proportion of population seeking employment is apt to go up in course of time. The fact that there is considerable unemployment and underemployment, points out the need for a big increase in employment opportunity in industries.

In India today, on the one hand there is a shortage of personnel in certain fields of activity, while on the other there is a surplus of human resources. This disharmony between the employment opportunities and the resources of personnel is one of the outstanding problems in India. Unless this anomaly is solved, the purpose of occupational information will be partly vitiated. In spite of the hurdles, our schools have undertaken a responsibility to provide relevant information of the avenues of employment to the youngsters. This is necessary because of the fact that every student should know the opportunities available as well as the liabilities which we have. This information may be catered in various ways, namely by contact with Employment Exchange, by availing of publication and advertisements in newspapers and through visits to factories as well as other places of industrial importance.

To be more practical, pupils should be provided with accurate and usable information about jobs, work-process, employment trends, opportunities, duties of the workers, qualifications of the workers, average income and status of the work. In other words, occupation should be classified into groups and displayed through charts in different ways. They should be classified on a definite basis, for example, on salary basis, educational requirements, subjects basis, etc. The most important condition for effective occupational information is the consciousness of the public and the guardians about its importance.

In conclusion, the individual is the best judge to choose any occupation and the teacher-counsellor is to help him do so. The external environment offers opportunities, but it also imposes limitations. One of the major contributions of the experts is to bring the complex reality into focus and to help the individual to evaluate both his opportunities and his limitations.

CHAPTER TWENTY

Problems of Guidance in India

GUIDANCE Programme in India is a recent development, and is naturally confronted with various problems which may be classified under different heads.

PSYCHOLOGICAL PROBLEMS

The Programme of Guidance is based on certain theories regarding the structure of human abilities. The techniques of guidance have to be evolved accordingly. There are extreme views and confusing opinions on personality structure and its bearing on guidance. In Britain, psychologists have more or less taken an ideographic approach and they still believe in the importance of intelligence ("g" factor) as a criterion for allocation. Recently, there has been a shift in emphasis from intelligence to personality because of the inadequacy of intelligence in predicting or explaining attainments. This has given rise to a very pertinent question as to the relative importance of intelligence and personality traits in the field of guidance and the bearing of each factor or trait on attainments. There is no research finding in respect of this in our country, and any differential prediction is hardly complete and scientific without any conclusive evidence regarding this question.

The function of guidance is mainly to orient an individual in the right direction. Sufficient data should be collected for the purpose and their significance determined in the light of the research, evidence and experience. But where are the scientific tools for arriving at estimates of abilities and personality traits having relevance to the problem? What has been done in this respect is only a rough and ready approach, and thus the problem is far from being objective and convincing to the guardians or any zealous student of guidance.

Another problem on guidance is the question of competence of the seven streams in the multilateral schools for diversification and differentiation on a psychological basis. As rightly pointed out by Dr. Rama Rao, some of the basic issues in a guidance programme are (*a*) personality and success in vocations (*b*) fundamental school skills and innate or constitutional capacities and (*c*) outcome of schooling and demand of occupations. In guiding an individual for curricular choice, functions such as selection of objectives, selection of content, instructional and evaluation procedure, and organization of learning experiences will have to be considered ; otherwise, curricular guidance will be incomplete.

PEDAGOGICAL PROBLEMS

The next problems centre round the question of availability of norms in respect of the tests. Without the norms it is not possible to have a coherent picture of either one's traits or one's individual differences. There are occasions when experience proves stranger than fiction. The question of relative influence of heredity and environment, though much discussed, is still open. The very superstructure built upon the pedagogical belief in inherent factors and traits, appears to be shaky and is thus subject to scepticism. Explorations of personality have been attempted by many, and impartial observers have come to believe in the futility of the optimistic approach to personality study. It appears to him like a wild-goose chase. This is perhaps the experience of the many who are devoted to psychological research which is often confronted with problems of equating the variables. Factor analysis or vector analysis is no panacea, as saturations are found to be so intense and varied that the interpretation and detection of isolated factors and unique traits prove arbitrary. The concept of culture-free tests is almost a dream, and thus every experimenter has to find the way out of the vicious circle after some amount of bewilderment and deliberation. There are various other pedagogical problems involved in guidance demanding fundamental researches and tested scientific knowledge.

PHILOSOPHICAL PROBLEMS

All guidance is postulated upon freedom of choice, and every theory of counselling implies an ethical position. It is ethical because it springs from responsibility for choice on the one hand and specific metaphysical hypothesis concerning what is preferable on the other. For those who view non-directive counselling as absolute freedom of choice the ultimate goal may be, as suggested, "know thyself", since there is no other absolute value towards which the counsellor may guide. But this knowledge of the self is too much to be expected from the school children.

SOCIOLOGICAL PROBLEMS

The present society is under the grip of a rapid change. At this stage of transition from the existing pattern to a new pattern, various problems will arise. There is disharmony everywhere and conflict at every stage. The socio-economic opportunities vary to a great extent and disharmonies between courses provided and occupational opportunities are striking.

The pressing demand for one course in preference to others presents another outstanding problem which is mainly sociological in nature. The choice of the majority for one or two courses is influenced by the prevailing sense of values attached to particular course or career by society and the state.

As observed by Dr. Rama Rao, relating schooling to employment in a more pragmatic and direct way would be extremely difficult so long as the educational systems of the country are not planned to match its manpower needs in the major sectors of industry, agriculture, commerce, services and other professions.

India is a vast country and her problems are numerous. Guidance presupposes some satisfactory standard of living and equality of opportunities. Until these conditions are fulfilled, a guidance programme is bound to lead to frustrations. There are certain problems of guidance which are both sociological and psychological in nature. These may be termed practical problems.

PRACTICAL PROBLEMS

Of many problems which will face the headmasters, the following deserve special mention:

(*a*) How to work out the guidance scheme and make parents guidance-minded in the present context.
(*b*) How to translate the existing informations in schools into estimates of general ability.
(*c*) How to start the work when there is no accepted set of tools for guidance.
(*d*) How to make provision for transfer in case some of the students admitted for some practical courses do not find them sufficiently interesting.

The success of the scheme thus depends upon how we meet these problems. On an analysis it will be evident that a number of difficulties pertains more to organization than to psychology. It would, therefore, be advisable to attempt a co-ordination between different bodies, for example parents, employment exchanges, teachers, headmasters and psychologists, in order to formulate a practical scheme for guidance.

We should think of the total programme for guidance along with the whole picture of society in our country and try to establish an integrated relationship between different factors of education.

CHAPTER TWENTY-ONE

Introduction to Statistics

EDUCATION is gradually becoming more and more experimental. It is no longer regarded as a purely subjective field as modern problems and needs are forcing experimental methods in education. Statistics are coming into operation for obvious reasons. Whenever any experiment is conducted it is done with a view to collecting certain data and interpreting them for generalization and arriving at a conclusion. Now this collection of data is not enough as much depends upon their arrangement, analysis and interpretation. All these processes fall under the jurisdiction of statistics. It is, therefore, important that in any educational investigation statistics will be indispensable. Besides, statistics as a science has an important part to play. For any systematic presentation of a picture of certain investigation, it becomes necessary to take the help of graph for the purpose of economy and statistical methods are also employed for comparison and scrutiny. It would be, therefore, evident that statistics in educational experiment has assumed great importance today.

Scores : Scores are expressed in quantitative terms for indicating the measurement of individuals. They may take different forms, namely time taken or amount done. Scores vary with performance and when they are expressed in equal units they constitute a scale. In the measurement of mental or social traits most of the variables with which we deal fall into a continuous series :

(*i*) Continuous series : A continuous series is one which is capable of any degree of sub-division although in practice divisions smaller than some convenient unit are rarely employed.

For example, physical measures such as height, weight, scores from mental and educational tests fall into continuous series. When gaps occur in a truly continuous series, these are to be attributed to a failure to measure enough cases.

(*ii*) Discrete series: Discrete series is a discontinuous one as it exhibits real gaps. Fortunately enough, nearly all the variables with which we deal in education and psychology fall into continuous series.

Scores or other numbers in a continuous series are to be thought of as distance along a continuum rather than as discrete points.

Step-intervals. Data collected from tests and experiments often have little meaning or significance until they have been classified or rearranged in a systematic way. This procedure leads to the organization of materials into few heads:

(*i*) Determination of the range of the interval between the largest and the smallest scores.

(*ii*) Decision as to the number and size of the group to be used in classification. Class interval is therefore helpful for grouping the data in suitable units and the number and size of these class intervals will depend upon the range of scores and the kind of measures which one is dealing. The number of class intervals which a given range will yield can be determined approximately by dividing the range by the interval tentatively chosen.

Tallies and Frequency of Steps. Tabulation of the separate scores within their proper class-intervals involves tallies and frequency of steps. Tallies are marked for indicating the entry of each score in appropriate step intervals under which they fall. It will be seen that the total number of frequencies indicated will be equal to the extent of the population.

Graphical Representation of Frequency Distribution. Aid in analysing numerical data may often be obtained from a graphic or pictorial treatment of the frequency distribution. Other methods of representing frequency distribution graphically are generally used. These methods yield the frequency polygon, the histogram, the cumulative frequency graph and the cumulative percentage curve or ogive.

Graphing or plotting is done with reference to two lines or co-ordinate axis—one the vertical or Y-axis, the other horizontal or X-axis. When all the points have been located with reference to the two axes, they are jointed in regular order to give the frequency polygon. In order to give symmetry and balance to a polygon one must exercise care in the selection of unit distances.

CENTRAL TENDENCY

Measures of Central Tendency. The value of a measure of central tendency is undeniable. After the scores and measures have been tabulated into a frequency distribution, the next task will be to calculate one or more measures of central tendency. Central tendency serves the purpose of a single measure which represents all of the scores made by the group and as such gives a concise description of the preformance of the group as a whole. Secondly, comparison of two or more groups is rendered feasible in term of typical performance with the help of central tendency.

There are three averages or measures of central tendency in common use: (*i*) the arithmetic mean, (*ii*) the median, (*iii*) the mode. Average is, however, used as general measure of central tendency.

Calculation of Measures of Central Tendency.

(*i*) Mean : The Arithmetic mean or the simple mean is a very popularly known measure of central tendency. It is the sum of the separate scores or the measures divided by their number.

(*ii*) Median (Mdn): Median is the mid-point in the series when ungrouped scores or other measures are arranged in order of size. When scores in a continuous series are grouped into a frequency distribution the median is the 50 per cent point in the distribution. To locate the median we take 50 per cent of our scores and count into the distribution till the 50 per cent point is reached.

(*iii*) Mode: Mode is the single measure or score which occurs more frequently in a simple ungrouped series of measures. When calculating the mode from a frequency distribution, we distinguish between the true mode and the crude mode. When data are to the mid-point of the interval which contains the largest frequency, the true mode is the point of greatest concentration in the distribution, that is, the point on which more measures fall than at any other point.

VARIABILITY

After the three measures of central tendency have been calculated the next step is to find some measures of the variability of our scores. There are generally four measures which have been devised to indicate the variability or dispersion within a set of measures. These are (*i*) range (*ii*) quartile deviation (*iii*) mean deviation (*iv*) standard deviation.

(*i*) Range: Range is the interval between the largest and the smallest scores. It is the most general measure of spread or scatter and it is computed when we wish to make a rough comparison of two or more groups of variability. Since the rough takes account of the extremes of the series only it is unreliable, when many small or large groups occur in the frequency distribution.

(*ii*) Quartile Deviation : Quartile Deviation is one-half the distance between the 75th and the 25th percentile in a frequency distribution. The 25th percentile is the first quartile on the scores-scale, the point below which 25 per cent scores lie. The 75th percentile is the third quartile on the scores-scale, the point below which lies 75 per cent of the scores.

To find Q, we have to substitute Q^3 and Q^1 in the previous formula

$$\frac{(Q^3—Q^1)}{2}$$

(*iii*) Mean Deviation (MD) : The mean deviation is the mean of the deviations of all the separate measures of a series taken from the central tendency. A large MD means that the scores of the distribution tend to scatter widely around the central tendency. A small MD means that they tend to be concentrated within a relatively narrow range:

$$MD = \frac{E|fn|}{1}$$

(*iv*) Standard Deviation (SD). The standard deviation is the measure of the variability generally employed in research. The SD differs from MD in several respects. This is usually denoted by the Greek letter sigma. The standard deviation is less affected by sampling errors. It is very widely used in cases of experiments demanding accuracy. The formula for SD or when series of scores are ungrouped is as follows:

$$\text{SD or } \lesseqgtr = \frac{\sqrt{EXZ}}{N} \text{ or } \lesseqgtr = \frac{\sqrt{Efx^{12}}}{N} - C^2.i \quad \text{(By short method)}$$

Co-efficient of Variation. It is often desirable to compare the variability of a given group upon two or more different tests or to compare the variabilities of two or more groups upon the same test. But owing to differences in measuring units we cannot compare the variability in height and the variability in weight of a given group directly nor can we compare the relative variability in height of groups. To enable us to tell whether one group is more variable than another we need a measure which takes account both of the central tendency and of the variability of the group and which is independent of the units in which ability is expressed. One such measure is known as the ratio $\frac{D}{M}$ called the co-efficient of variation or V. Objection has been raised to the use of V in comparing the relative variability of tests scores, because the true zero point of ability in mental and educational tests is unknown.

When to use the Mean : Mean is generally used when the use of the mid-points becomes feasible because of the normal probability curve :

(*i*) When each score or measure should have equal weight in determining central tendency ;
(*ii*) When the measure of central tendency is intended to have the highest reliability ;
(*iii*) When standard deviation and product moment co-efficients are to be computed mean is generally used.

When to use the Median : When a quick measure of central tendency is wanted the median is generally used. It is also used when there are extreme measures which would effect the mean disproportionately and when it is desired that certain scores should influence the central tendency.

When to use the Mode: Mode is generally used when the most often popular score is sought and when a quick approximate measure of concentration is wanted.

CUMULATIVE DISTRIBUTION

Besides, polygon and histogram, certain other means are used to represent the frequency distribution. These are known as cumulative frequency graph, the cumulative percentage curve or ogive. In this graph the distribution is shown in its cumulative form and thus the cumulative distribution can be visualized on an observation of the graph.

Cumulative Frequency Distribution. The cumulative frequency distribution may be represented by means of the cumulative frequency graph. Before we can plot a cumulative frequency graph the scores of the distribution must be added serially or cumulated. When plotting the frequency polygon the frequency on each interval is taken in the mid-point of the class interval, but in constructing a cumulative frequency curve each cumulative frequency is plotted at the upper limit of the interval upon which it falls. This is because we are adding progressively from bottom up and hence each cumulative frequency carries through the upper limit of the interval. When plotting ogive a different procedure is adopted and in this connection the calculation of percentile rank deserves special mention. As the median is a point in frequency distribution below which lie 50 per cent of the measures of the scores, the quantities mark a point in the distribution below which lie 25 per cent and 75 per cent of the measures. These points are called percentile. The method of calculating percentile is essentially the same as that employed in finding the median. The calculating percentile rank in a frequency distribution is, however, a bit different. The distinction between percentile and percentile rank is that in calculating percentile one starts with a certain percentage N. He then counts into the distribution the given per cent and the point reached is the required percentile.

Cumulative Percentage Curve or Ogive. The cumulative percentage curve or ogive differs from the cumulative frequency graph in that the frequencies are expressed as cumulative per cent of N on the Y axis instead of as cumulative frequencies. The frequencies are generally cumulative from the low end of the distribution upward as described before. These cumulative frequencies are expressed as percentages of N and the conversion of cumulative frequency into cumulative percentage can be carried out by dividing cumulative frequency by N.

Graphical Representation of Cumulative Distribution. The cumulative distribution may be graphically represented in various forms of which cumulative frequency graph and cumulative percentage curve deserve special mention. In this connection the different uses of the Ogive may be mentioned. When Ogives are representing their scores on a given test plotted upon the same co-ordinate axis a useful overall comparison of two or more groups is provided. Besides this comparison of two or more groups many other interesting observations can also be made. The percentile norms can also be found out through these curves. Norms are measures of achievement which represent the typical performance of a designated group. Percentile norms are specially useful in dealing with educational achievement examination, when one wishes to evaluate and compare the achievement of a given student in a number of subject-matter tests.

Other Graphical Representation of Statistical Data. Data obtained from many problems in mental measurement especially those which involve the study of changes attributable to growth, practice, learning and fatigue may be treated profitably by graphical methods. Two devices which are very widely used are (*i*) the Line graph, frequently found in experimental psychology, (*ii*) the Bar diagram, more often met with in education, (*iii*) the Section diagram and (*iv*) the Pictograph diagram.

(*i*) The Line Graph: This graph is constructed in the usual manner with the help of the two axes. When two variables demand same tabulation and graphical representation, the line graph proves very useful.

(*ii*) The Bar Diagram : The Bar Diagram Bar graph is used in psychology to compare the relative amount of the same attribute possessed by two or more groups. In education, the Bar graph may be used to compare several different variables.

Examples are distribution of students, time in and out of the school, teachers' salaries by states or districts, relative expenditures for various purposes. A common form of the Bar graph is that in which a set of Bar is used the length of the Bar being proportionate to the amounts of the variable possessed. For emphasis, however, a space is usually left between the Bars which are drawn side by side and may be either vertical or horizontal.

(*iii*) The Sector Diagram : Sector diagram is used for the sake of compactness in the field of education, commerce and psychology. A circle is divided in proportionate areas by different lines drawn from centre to the circumference. Thus each sector of the circle represents the proportion of one aspect in relation to whole. The Sector diagram is also known as pie-graph, because the same circle is divided into representative areas. This is very popular in commerce for its advantage of compactness.

(*iv*) The Pictograph Diagram : A Pictograph is also an attempt to exhibit figures with the help of pictures. The percentage in proportion is illustrated here through suitable media, namely human forms, bags, etc. Pictograph has additional advantage for its illustrative value. In almost all the educational exhibitions Pictograph has its place. It is very expressive and at the same time useful.

NORMAL DISTRIBUTION

Normal probability of a given event is defined as the expected frequency of occurrence of this event among events of a like sort and this probability may be stated most simply by a ratio. A normal probability curve or normal curve is of great value in mental measurement, because of the need for understanding the characteristics of frequency distribution through the normal curve. It is a bell-shaped curve drawn on the X axis. If we divide the area under each curve through the central height point to the base line by a line drawn perpendicularly the two parts thus formed will be similar in shape and very nearly equal in area. Generally, 68 per cent of cases lie in middle and the rest spread over the extreme areas. The base line that is X axis, is divided into units from—3 $\lesseqgtr$ to+3 $\lesseqgtr$ that is, into 6 divisions and 68.6 per cent cases lie between—1 $\lesseqgtr$ and + 1 $\lesseqgtr$.

Comparing Two Distributions. The two distributions may be compared on the assumption that they are sensibly normal and their mean and median are almost placed at the same point. This problem may also be solved by direct calculation from the distribution of boys and girls scores without any assumption as to the normality of distribution. The agreement between the percentage of overlapping found by direct calculation from the distribution, and that found by the use of the probability tables will nearly be close especially if the groups are large and the distribution fairly symmetrical When overlapping distributions are small and not with very regular outline, it is safer to use the method of direct calculation since no assumption is then made.

Finding Relative Difficulty of Test Items. The first task for finding out the relative difficulty of test question is to examine the percentage of the population successful in correctly answering the item. This is known as finding out the difficult value of a particular item. The higher the percentage of failures in correct response to an item, the greater is the difficulty value.

Divide a Group into Sub-group according to Capacity. To find the percentage of a whole group belonging in a section, one is to find the percentage of a normal distribution lying between the upper limit and the lower limit of that section. The percentages in other groups are calculated in the same way. The above procedure may be used to determine the numbers to be assigned to each of any given number of grade groups. The larger or more unselected the group, the more rarely is this assumption justified.

When a Distribution can deviate from a Normal Form. It is often important for the research worker to know why distributions diverge from the normal form, and this is specially true when the deviation from the normality is large and significant. The reasons why distributions exhibit skewness and kurtosis are numerous, and often complex, but a careful analysis of the data will often permit the setting up of a hypothesis concerning non-normality which may be tested experimentally. Common causes of assymetry all of which must be taken into consideration by the careful experimenter are many, namely (*i*) unrepresentative or bias sampling, (*ii*) use of unsuitable tests, (*iii*) distribution of traits, the distribution of which are not normal, (*iv*) the influence upon distribution form of errors made in the construction and administration of tests.

CORRELATION

Linear Correlation. It is more important to examine the relationship of one ability to another than to measure performances singly.

It means that it can be described by a straight line, that is, the correlation is in the form of simple agreement.

Product moment co-efficient of correlation may be thought essentially as the ratio which expresses the extent to which changes in one variable are accompanied by changes in a second variable. When this ratio is written as $\frac{EXY}{NDXDY}$ it becomes the well-known expression for Y, which is known as the product moment co-efficient of correlation.

Scatter Diagram and Correlation Table. Scatter diagrams scatter different frequencies showing correlation between two sets of scores. When the smaller number is the ration method described to be easy and simple may be employed for computing the co-efficient correlation between two sets of data. But when N is large much time and labour may be saved by first arranging the data in the form of a diagram or chart and then calculating deviation from assumed instead of from actual mean. The construction of a scatter gram is relatively simple. Along the left hand margin from bottom to top are laid of class intervals of one distribution. After all of the tallies have been listed, the frequency of each cell is added and entered in the diagram. The sector gram is then a correlation table. Several interesting facts may be gleaned from the correlation table as it stands.

CHAPTER TWENTY-TWO

Planning and Research in Education

TIME IS changing and education is now receiving more attention than before. Education is now regarded as dynamic, and as such experimental. Life and education cannot be conceived in isolation ; each draws materials from the other. With the march of time, education has to keep pace with the demands of society and life.

Education today has received some experimental bias for reasons not far to seek. That is why researches in education are being encouraged everywhere in the civilized world. The term "research" is very popular particularly in the field of physical science. But in the field of education it is a fairly recent development. It generally means some sort of a systematic enquiry or investigation in any line. Educational research may thus include a critical study of relevant literature for its further development for new interpretation or a field work of experimental nature.

In any case, the following are the main stages involved:

(*a*) Defining the problem.
(*b*) Building the theoretical framework.
(*c*) Collecting the data.
(*d*) Interpretation.
(*e*) Summary and conclusion.

The present thesis, however, intends to concentrate on experiments of a psychological nature and discussion will be made accordingly.

In any psychological research, the experimental design is of supreme importance. Much depends upon the planning and a well-thought plan ensures the success of the research to a certain extent. It is, therefore, advisable to devote considerable time for selecting the specific field of research. One should not lose patience while going through the previous researches in the field as the knowledge of the previous researches in the field is essential for further exploration. It is often seen that the field of research gradually becomes narrower and pointed as the work advances. New ideas and fresh avenues may favour the research worker after some advance has been made in the proposed field. It also becomes a common experience with many and the title of the work naturally changes. As one goes deep, new lights flash and sometimes tempt the research worker even to change his design. This is not always desirable and the duty of the researcher will, therefore, be to pursue one objective up to the last and not to change his field now and then. The direction should not ordinarily be changed until the problems prove insurmountable. In short, one should look back and see ahead as far as possible before defining the exact problem.

It often happens that one is to start with a few assumptions or hypotheses. But the assumptions should be supported by relevant theories and argument. It is not always necessary that a problem should be defined in the usual or popular way. There may be a technical interpretation of new meaning attached to the problem or a different way of seeing the same thing. This leaves a scope for re-evaluation and verification of the previous research findings. There is every reason to believe, that there should be a theoretical framework in support of the view or hypothesis.

Every type of experimental research demands a thorough enquiry and field work. The usual procedure is to arrive at findings or certain conclusions on the basis of the data collected. But the collection of data presupposes the construction of some techniques or tests for making the enquiry, the specific field or section of population on whom the enquiry is made, as well as the direction for administration of the tests in some cases. The task of the researcher, therefore, becomes easier if he arranges his programme accordingly:

(*a*) Construction of the tests or techniques.
(*b*) Sampling.
(*c*) Administration of the tests.
(*d*) Collecting the data and arranging them.

While constructing the tests and techniques one should not forget that they should not be time-consuming and too complicated from the standpoint of administration. The case of administration must be ensured. Moreover, the tests should preferably be objective and should not leave much scope for personal bias.

The selection of population is also one of the important tasks. There should be an attempt to select a homogeneous population from the same socio-economic environment, unless something different is arranged deliberately.

One of the outstanding problems of a psychological investigation is that of controlling the external factors vitiating the purpose of the investigations It is, therefore, imperative to standardise the test situations and control the distracting factors as far as possible. There should be always a clear-cut direction for administration of the tests. Another outstanding difficulty which is to be confronted by the investigator in our country is that of getting the correct age, if attempt is made to make an investigation on the age basis.

Much depends upon the administration of the tests, as an efficient administration ensures the reliability of the data to a considerable extent.

When the collection of the data is complete the next task is to arrange them conveniently. An efficient arrangement is essential for a successful interpretation. One should be extremely careful and tidy when arranging the data as otherwise the investigator may face unnecessary troubles. Great care should be taken when calculating machines are used as the slightest negligence or absent-mindedness might lead to a colossal wastage of time and energy.

Interpretation of the data is perhaps the most difficult part of the investigation and this requires a fair knowledge of statistics. The statistical tools employed for interpretation should be above criticism. It is, therefore, desirable that the experimenter should think of them while making the experimental design.

It is sometimes seen that the result arrived at is below the expectation or something different from what was thought of. In such cases the investigator may feel tempted to drive the data to serve his own purpose. This should be strictly avoided as lack of honesty leads to the defeat of the very purpose of experimental researches. It is thus always advisable to admit the limitations of the research and derive conclusion accordingly.

APPENDIXES

Appendix I

(Statistical Treatment)

Scientific Basis of Guidance

COMPARISON OF TECHNIQUES

TABLE 1A

PILOT STUDY (PERSISTENCE TEST)

		Range of final scores	*Standard deviation*
Sub-test—1	..	16—45	6.33
Sub-test—2	..	6—15	2.09
Sub-test—3	..	8—30	3.69

TABLE 1B

Range of final scores of the battery	*Standard deviation*	*Split half reliability*
30—90	16.2	.72 Test-Retest

TABLE 1C

TEACHERS RATINGS ON PERSISTENCE

Set of Rating	*Range*	*Standard. deviation*
No. 1.	10—40	6.16
No. 2.	15—64	10
No. 3.	10—65	13

TABLE 1D

(PILOT STUDY—TABLES SHOWING THE RANGE AND STANDARD DEVIATION OF SCORES)

INDIAN SCHOOL OF ARTS

	Interest						*Persistence*
	Art:	*Tech:*	*Com:*	*Agri:*	*Sc:*	*Hum:*	
Range	40—56	30—42	28—40	32—44	28—42	34—46	40—82
S. D.	3.3	2.45	3	2.9	3.4	2.6	7.4

INDIAN SCHOOL OF TECHNOLOGY (JADAVPUR POLYTECHNIQUE)

	Interest						*Persistence*
	Art:	*Tech:*	*Com:*	*Agri:*	*Sc:*	*Hum:*	
Range	25—40	42—54	26—40	28—40	36—50	32—46	48—90
S. D.	3	3.2	3.4	2.9	3.1	2.8	8.2

GOENKA COLLEGE OF COMMERCE

	Interest						*Persistence*
	Art:	*Tech:*	*Com:*	*Agri:*	*Sc:*	*Hum:*	
Range	20–35	24–36	40–58	26–40	22–36	27–42	42–86
S. D.	2.9	2.3	3.4	3.2	3.6	3.3	8.09

STATE COLLEGE OF AGRICULTURE (BEHALA)

	Interest						*Persistence*
	Art:	*Tech:*	*Com:*	*Agri:*	*Sc:*	*Hum:*	
Range	26–40	28–44	30–44	42–58	24–38	32–44	40–82
S. D.	3.1	4	3.8	2.9	2.7	2.4	6.6

BARASAT INTERMEDIATE COLLEGE (HUMANITIES SECTION)

	Interest						*Persistence*
	Art:	*Tech:*	*Com:*	*Agri:*	*Sc:*	*Hum:*	
Range	28–42	22–38	24–34	26–40	24–36	44–56	40–80
S. D.	2.2	3.1	2.3	3.3	2.9	3.7	6.8

BARASAT GOVERNMENT COLLEGE (SCIENCE SECTION)

	Interest						*Persistence*
	Art:	*Tech:*	*Com:*	*Agri:*	*Sc:*	*Hum:*	
Range	24–36	32–46	30–42	28–40	42–56	28–40	52–88
S. D.	2.4	3.3	3.4	2.8	3.2	2.6	7.3

TABLE 2A

DETAILS OF ITEM-ANALYSIS–PILOT STUDY

Persistence items of Questionnaire–1

Item No.	*Upper 3rd (%)*	*Middle (%)*	*Lower 3rd (%)*	*App: Difficulty value*	*App: Validity valu*
1	45	33	33	63	12
2	93	78	69	20	24
3	80	48	36	45	44
4	33	6	12	83	21
5	72	69	65	31	7
6	60	27	33	60	27
7	78	48	36	46	42
8	93	72	48	29	45
9	96	93	78	11	18
10	18	12	0	90	18
11	36	15	30	73	6
12	87	60	42	37	45
13	72	36	24	56	48

TABLE 2A (*Contd.*)

Item No.	*Upper 3rd (%)*	*Middle (%)*	*Lower 3rd (%)*	*App: Difficulty value*	*App: Validity value*
14	78	45	24	51	54
15	63	54	18	45	45
16	66	60	55	43	21
17	78	54	27	47	51
18	66	46	36	51	30

(*NB*: Difficulty values were arrived at by the formula

$$100 - \frac{U + M + L}{3}$$

and Validity Values by $U - L$.)

TABLE 2B

Persistence items of Questionnaire–2.

Item Nos.	*Upper 3rd (%)*	*Middle (%)*	*Lower 3rd (%)*	*App: Difficulty value*	*App: Validity value*
1	75	15	3	69	72
2	72	39	42	49	30
3	96	84	39	27	57
4	93	36	18	51	75
5	93	87	42	26	51
6	46	69	54	17	42

ITEM ANALYSIS

TABLE 2C (i)

Sub-test I.

Original Item No.1	*Group*	*Revised Item No.*	*Chisquare Value*	*Remarks*
1	*Arts*	A (1)	19.9	
9	,,	—	1.8	Dropped
13	,,	—	1.1	,,
20	,,	—	.2	,,
25	,,	K (iii)	12.7	
34	,,	E (iii)	15.6	
39	,,	M (i)	30.9	
44	,,	—	.1	,,
49	,,	F (ii)	5.2	Modified
60	,,	S (i)	12.7	
61	,,	P (ii)	17.9	
68	,,	—	—	Dropped
69	,,	N (iii)	26.8	
52	,,	Q (i)	13.3	Originally belonged to Academic group but later on found suitable for this group.

TABLE 2C (ii)

Original Item No.	*Group*	*Revised Item No.*	*Chisquare Value*	*Remarks*
4	*Technical*	A (ii)	11	
11	,,	N (i)	15.1	
15	,,	H (i)	10.6	
23	,,	F (iii)	14.2	
29	,,	T (i)	5.7	Revised
32	,,	—	.4	Dropped
40	,,	—	1.7	,,
45	,,	R (ii)	10.1	
50	,,	L (iii)	18.9	
57	,,	—	1.6	
59	,,	J (ii)	16.2	
62	,,	—	11.2	
77	,,	B (i)	3.9	Modified
79	,,	Q (iii)	11.8	

TABLE 2C (iii)

Original Item No.	*Group*	*Revised Item No.*	*Chisquare Value*	*Remarks*
3	*Commerce*	A (iii)	11.02	
10	,,	B (ii)	13.4	
16	,,	C (i)	14.4	
21	,,	I (i)	4.9	Revised
26	,,	—	.8	Dropped
33	,,	—	1.1	,,
37	,,	—	.7	,,
48	,,	K (ii)	13.1	
54	,,	R (iii)	17.2	
58	,,	G (iii)	35.3	
63	,,	—	.2	Dropped
65	,,	S (ii)	3.1	Revised
75	,,	P (iii)	12.7	Originally belonged to Academic but later on found suitable for commerce after modification.
82	,,	—	.6	Dropped.
84	,,	Q (ii)	13	

TABLE 2C (iv)

Original Item No.	*Group*	*Revised Item No.*	*Chisquare Value*	*Remarks*
5	*Agriculture*	C (ii)	11.2	
7	,,	—	2.6	Dropped.
18	,,	G (ii)	3.9	Modified.
19	,,	S (iii)	4.1	,,
27	,,	D (i)	13	

TABLE 2C (iv) (*Contd.*)

Original Item No.	*Group*	*Revised Item No.*	*Chisquare Value*	*Remarks*
36	*Agriculture*	H (iii)	9	
42	,,	M (iii)	15.4	
47	,,	—	.4	Dropped
51	,,	L (ii)	11.1	
56	,,	J (i)	13.3	
66	,,	P (i)	17.0	
70	,,	B (iii)	10.7	
81	,,	—	.6	Dropped
83	,,	—	.2	,,

TABLE 2C (v)

Original Item No.	*Group*	*Revised Item No.*	*Chisquare Value*	*Remarks*
2	*Science*	—	.6	Dropped
12	,,	D (iii)	3.3	Revised
17	,,	—	1.2	Dropped
24	,,	F (i)	6.8	,,
30	,,	—	.9	,,
35	,,	E (ii)	13.4	
38	,,	O (iii)	18.8	
46	,,	M (ii)	9.1	
53	,,	L (i)	04.2	Modified
64	,,	—	1.1	Dropped
71	,,	T (iii)	13.0	
74	,,	I (iii)	12.0	
76	,,	O (ii)	17.0	
78	,,	R (i)	16.0	

TABLE 2C (vi)

Original Item No.	*Group*	*Revised Item No.*	*Chisquare Value*	*Remarks*
6	*Humanities*	C (iii)	15.0	
8	,,	G (i)	14.4	
14	,,	E (i)	5.1	Modified
22	,,	I (ii)	4.9	Revised
28	,,	D (ii)	9.4	
31	,,	—	1.4	Dropped
41	,,	N (ii)	5.2	Modified
43	,,	—	1.3	Dropped
52	,,	—	10.1	Transferred to Arts after modification

TABLE 2C (vi) (*Contd.*)

Original Item No.	*Group*	*Revised Item No.*	*Chisquare Value*	*Remarks*
55	,,	J (iii)	15.9	
72	,,	K (i)	4.8	Revised
73	,,	O (i)	4.6	Dropped
75	,,	—	8.2	Transferred to Commerce after revision.
80	,,	T (ii)	7.1	Revised

TABLE 2D

Sub-test No. 2

Item No.	*Group*	*Chisquare Value*	*Remarks*
3	ARTS	.50	Dropped
9		12	
19		16.1	
23		44	
28		.4	Dropped
31		11	
	TECHNICAL		
6		.4	Dropped
12		.3	Dropped
16		5	
21		5	
33		13	
36		4	
	COMMERCIAL		
4		1.6	Dropped
10		13	
15		7.8	
20		.29	Dropped
24		13.5	
29		12.7	
	SCIENCE		
5		4.3	
7		13.3	
11		9	
25		.2	Dropped
30		15	
32		.5	Dropped
	ACADEMIC		
17		4.8	
1		.7	Dropped
13		5.9	
34		6.2	
35		1.1	Dropped
26		—	

TABLE 2D (*Contd.*)
Sub-test No. 2

Item No.	*Group*	*Chisquare Value*	*Remarks*
	AGRICULTURE		
2		8	
8		3.5	
14		12	
18		.9	Dropped
22		.1	Dropped
27		8	

TABLE 2E
Sub-test No. 3

Item No.	*Group*	*Chisquare Value*	*Remarks*
9	ARTS	.5	Dropped
17		8.7	
21		18	
24		1.2	Dropped
29		12.5	
	TECHNICAL		
2		11.4	
5		.8	Dropped
8		1.1	Dropped
11		11.7	
26		9.2	
	COMMERCE		
12		10	
19		8	
23		.7	Dropped
25		18	
30		1.1	Dropped
	ACADEMIC		
1		6.2	
4		.9	Dropped
7		.75	Dropped
10		7.2	
13		8.9	
	AGRICULTURE		
6		18	
15		18	
20		15	
22		1.4	Dropped
28		1.2	Dropped
	SCIENCE		
3		9.7	
14		10.2	
16		.6	Dropped
18		11.1	
27		.2	Dropped

TABLE 2F

Sub-test No. 4

Item No.	*Group*	*Chisquare Value*	*Remarks*
6	ARTS	7.5	
11		.35	Dropped
16		12.5	
21		25.9	
26		8.9	
	TECHNICAL		
4		13.7	
9		11.1	
14		12.4	
19		.40	Dropped
30		12	
	COMMERCE		
3		17.7	
8		16.1	
13		11.5	
24		4.4	Dropped
29		17.2	
	AGRICULTURE		
5		12.3	
10		.28	Dropped
15		6.7	
20		5.4	
25		8.3	
	ACADEMIC		
1		11.2	
12		11.4	
17		8.9	
22		.13	Dropped
27		5.5	
	SCIENCE		
2		12.2	
7		9.4	
18		.62	Dropped
23		13.8	
28		8.4	

RELIABILITY CO-EFFICIENT

TABLE 3A

Persistence Test

	Split-half Reliability	*Test-Retest Reliability*
I	.71 ± .03	
II		.75 ± .03

TABLE 3B

VALIDITY VALUE

Persistence Test Battery	*Teachers' agreed Rating*
Do	.69 ± .03

TABLE 3C

TEST-RETEST RELIABILITY OF ITEMS FOR ASSESSING INTEREST IN

Fine Arts	*Tech.*	*Com.*	*Agri.*	*Sc.*	*Hum.*
.71 ± .03	.72 ± .04	.78 ± .03	.71 ± .04	.78 ± .03	.74 ± .03

TABLE 4A

INTER-CORRELATION BETWEEN DIFFERENT SUB-TESTS ON PERSISTENCE

	Sub Test I	Sub Test II	Sub Test III
Sub Test No. 1.	—	.54	.56
Sub Test No. 2.	.54	—	.59
Sub Test No. 3.	.56	.59	—

TABLE 4B

INTER-RELATION BETWEEN INDIVIDUAL SUB-TESTS ON INTEREST

Test Battery on Interest

	S.T.1.	S.T.2.	S.T.3.	S.T.4.
S.T. 1	—	.62 ± .02	.68 ± .01	.65 ± .03
S.T. 2	.62 ± .02	—	.61 ± .04	.60 ± .05
S.T. 3	.68 ± .01	.61 ± .04	—	.66 ± .02
S.T. 4	.65 ± .03	.60 ± .05	.66 ± .02	—

TABLE 5A

INTER-CORRELATION BETWEEN INDIVIDUAL SUB-TEST ON INTEREST AND THE TEST BATTERY EXCLUDING THE PARTICULAR SUB-TEST

	S.T.1.	S.T.2.	S.T.3.	S.T.4
Ac	.68	.61	.67	.62
Sc	.59	.60	.63	.65
T	.58	.62	.66	.64
A	.59	.63	.62	.64
C	.57	.59	.60	.62
Ag	.56	.63	.64	.65

TABLE 5B

INTER CORRELATION BETWEEN INDIVIDUAL SUB-TEST ON PERSISTENCE AND THE TEST BATTERY EXCLUDING THE PARTICULAR SUB-TEST

	Test-battery
S.T. 1.	.65
S.T. 2.	.59
S.T. 3.	.61

TABLE 6

TABLE SHOWING INTER-CORRELATION BETWEEN DIFFERENT TESTS

1. Bagbazar high School (Com.)

	Interest.	*Persistence.*	*Attainments.*	
	I	II	III	
I	—	.41	.57	r 13.2 = .41
II	.41	—	.47	r 23.1 = .42
III	.57	.47	—	r 12.3 = .19

2. Hindu School (Tech.)

	I	II	III	
I	—	.43	.59	r 13.2 = .42
II	.43	—	.56	r 23.1 = .28
III	.59	.46	—	r 13.3 = .23

3. Kamala Girl's School (Fine Arts)

	I	II	III	
I	—	.39	.58	r 13.2 = .43
II	.39	—	.45	r 23.1 = .30
III	.58	.45	—	r 12.3 = .18

4. Victoria Institute (Fine Arts)

	I	II	III	
I	—	.42	.57	r 13.2 = .42
II	.42	—	.49	r 23.1 = .33
III	.57	.49	—	r 12.3 = .22

5. Uttarpara Govt. School (Technical)

	I	II	III	
I	—	.43	.60	r 13.2 = .51
II	.43	—	.48	r 23.1 = .30
III	.60	.48	—	r 12.3 = .21

6. Gokhale Memorial School (Fine Arts)

	I	II	III	
I	—	.46	.58	r 13.2 = .64
II	.46	—	.49	r 23.1 = .31
III	.58	.49	—	r 12.3 = .29

7. Jagatbandhu Institute (Technical)

	I	II	III	
I	—	.44	.59	r 13.2 = .49
II	.44	—	.47	r 23.1 = .27
III	.59	.47	—	r 12.3 = .22

8. Howrah Zila School (Technical)

	I	II	III	
I	—	.42	.56	r 13.2 = .47
II	.42	—	.41	r 12.3 = .25
III	.56	.41	—	r 23.1 = .23

9. Ramkrishna Vidyalaya (Commerce)

	I	II	III	
I	—	.40	.59	r 12.3 = .19
II	.40	—	.44	r 13.2 = .51
III	.59	.44	—	r 23.1 = .28

10. Howrah Girls' High School (Humanities)

	I	II	III	
I	—	.43	.58	r 12.3 = .23
II	.43	—	.45	r 13.2 = .48
III	.58	.45	—	r 23.1 = .26

11. R. K. Mission School, 24 Parganas, Rahara, (Technical)

	I	II	III	
I	—	.44	.61	r 12.3 = .20
II	.44	—	.49	r 13.2 = .50
III	.61	.49	—	r 23.1 = .31

12. Vidyanagar Shiksha Sangha, 24 Parganas. (Agriculture)

	I	II	III	
I	—	.43	.58	r 12.3 = .25
II	.43	—	.42	r 13.2 = .49
III	.58	.42	—	r 23.1 = .23

13. Barashat Govt. High School, 24 Parganas. (Commerce)

	I	II	III	
I	—	.42	.59	r 12.3 = .31
II	.42	—	.46	r 13.2 = .47
III	.59	.46	—	r 23.1 = .24

14. Bashirhat High School, 24 Parganas. (Commerce)

	I	II	III	
I	—	.45	.62	r 12.3 = .20
II	.45	—	.48	r 13.2 = .52
III	.62	.48	—	r 23.1 = .28

15. Barrackpore Govt. High School, 24 Parganas, (Science)

	I	II	III	
I	—	.43	.60	r 12.3 = .21
II	.43	—	.47	r 13.2 = .47
III	.60	.47	—	r 23.1 = .46

16. Sarisha S. N. Girls' School, 24 Parganas, (Fine Arts)

	I	II	III	
I	—	.42	.58	r 12.3 = .22
II	.42	—	.45	r 13.2 = .48
III	.58	.45	—	r 23.1 = .28

17. Itachuna High School, Hooghly, (Agriculture)

	I	II	III	
I	—	.42	.61	r 12.3 = .18
II	.42	—	.48	r 13.2 = .52
III	.61	.48	—	r 23.1 = .30

18. Shyamsundar R. L. Vidyalaya, Burdwan, (Agriculture)

	I	II	III	
I	—	.40	.58	r 12.3 = .18
II	.40	—	.46	r 13.2 = .48
III	.58	.46	—	r 23.1 = .31

19. Burdwan Municipal Girls' School (Fine Arts)

	I	II	III	
I	—	.43	.61	r 12.3 = .22
II	.43	—	.45	r 13.2 = .53
III	.61	.45	—	r 23.1 = .26

20. Midnapore Collegiate School (Commerce)

	I	II	III	
I	—	.44	.58	r 12.3 = .24
II	.44	—	.45	r 13.2 = .49
III	.58	.45	—	r 23.1 = .26

21. Giagange R. V. S. Vidya Mandir (Murshidabad) (Humanities)

	I	II	III	
I	—	.40	.61	r 12.3 = .14
II	.40	—	.49	r 13.2 = .52
III	.61	.49	—	r 23.1 = .34

22. Bishnupur High School (Humanities)

	I	II	III	
I	—	.44	.59	r 12.3 = .23
II	.44	—	.46	r 13.2 = .41
III	.59	.46	—	r 23.1 = .28

23. Maliara School (Agriculture)

	I	II	III	
I	—	.41	.58	r 12.3 = .26
II	.41	—	.45	r 13.2 = .48
III	.58	.45	—	r 23.1 = .28

24. Banerjeedanga High School, Midnapore (Agriculture)

	I	II	III	
I	—	.42	.60	r 12.3 = .18
II	.42	—	.48	r 13.2 = .50
III	.60	.48	—	r 23.1 = .31

25. Bhatpara High-School, 24 Parganas (Humanities)

	I	II	III	
I	—	.43	.63	r 12.3 = .19
II	.43	—	.48	r 13.2 = .67
III	.63	.48	—	r 23.1 = .30

26. Nabadwip Bangabani Girls' High School, Nadia (Humanities)

	I	II	III	
I	—	.46	.63	r 12.3 = .62
II	.46	—	.48	r 13.2 = .62
III	.63	.48	—	r 23.1 = .29

27. Krishnanagore Collegiate School, Nadia (Science)

	I	II	III	
I	—	.42	.59	r 12.3 = .29
II	.42	—	.46	r 13.2 = .50
III	.59	.46	—	r 23.1 = .29

28. Konnagore High School, Hooghly (Science)

	I	II	III	
I	—	.43	.61	r 12.3 = .29
II	.43	—	.49	r 13.2 = .50
III	.61	.49	—	r 23.1 = .32

29. Vivekananda Institution, Howrah (Science)

	I	II	III	
I	—	.43	.63	r 12.3 = .21
II	.43	—	.45	r 13.2 = .54
III	.63	.45	—	r 23.1 = .22

30. Maldaha Zilla School (Science)

	I	II	III	
I	—	.44	.62	r 12.3 = .46
II	.44	—	.47	r 13.2 = .66
III	.62	.47	—	r 23.1 = .28

NB: I=Interest; II=Persistence; III=Attainments;

APPENDIX I—F
RANDOM SAMPLING FROM THIRTY SCHOOLS
MAIN EXPERIMENT

(*Interest Scores*)

V 1. BAGHBAZAR HIGH SCHOOL (Commerce)

	Com.
No. of Pupil	36
Range of Score	23-46
S. D.	5.6 ± .78
Mean	36.5 ± 1.12

U 2. HINDU SCHOOL (Technical)

	Tech.
No. of Pupil	38
Range of Score	26-53
S. D.	6.7 ± .89
Mean	43.5 ± 1.28

U 3. KAMALA GIRLS' SCHOOL (Fine Arts)

No. of Pupil	38
Range of Score	26-53
S. D.	6.3 ± .86
Mean	41.5 ± 1.21

C 5. UTTARPARA GOVT. SCHOOL, HOOGHLY (Technical)

No. of Pupil	46
Range of Score	25-52
S. D.	6.5 ± .93
Mean	40.5 ± 1.3

Cu 7. JAGATBANDHU INSTITUTE (Technical)

No. of Pupils	38
Range of Score	26-53
S. D.	6.7 ± .92
Mean	39.5 ± 1.28

I 9. RAMKRISHNA VITALNATH VIDYALAYA (Commerce)

No. of Pupils	37
Range of Score	24-55
S. D.	7 ± .97
Mean	40.9 ± 1.36

R 11. R. K. MISSION SCHOOL, RAHARA (Technical)

No. of Pupils	40
Range of Score	32-57
S. D.	5.44 ± .71
Mean	44.3 ± 1

R 13. BARASAT GOVERNMENT HIGH SCHOOL (Commerce)

No. of Pupils	41
Range of Score	30-57
S. D.	6 ± .86
Mean	41.7 ± 1.2

C 4. VICTORIA INSTITUTE (Fine Arts)

No. of Pupil	46
Range of Score	25-48
S. D.	5.1 ± .9
Mean	38 ± 1.1

Cu 6. GOKHALE MEMORIAL SCHOOL (Fine Arts)

No. of Pupil	39
Range of Score	32-50
S. D.	4.1 ±
Mean	43 ± .76

I 8. HOWRAH BOYS' SCHOOL (Technical)

No. of Pupils	38
Range of Score	26-53
S. D.	6.7 ± .92
Mean	43.2 ± 1.28

I 10. HOWRAH GIRLS' HIGH SCHOOL (Humanities)

No. of Pupil	40
Range of Score	28-55
S. D.	5.9 ± .84
Mean	40.3 ± 1.18

R 12. VIDYANAGAR SHIKSHA SANGHA, 24 PARGANAS (Agricultural)

No. of Pupils	38
Range of Score	26-53
S. D.	6.6 ± .91
Mean	39.22 ± 1.26

C 14. BASHIRHAT HIGH SCHOOL, 24 PARGANAS (Commerce)

No. of Pupils	44
Range of Score	24-47
S. D.	4.8 ± .73
Mean	38.5 ± 1

C 15. BARRACKPORE GOVERNMENT HIGH SCHOOL, 24 PARGANAS (Science)

No. of Pupils	38
Range of Score	24-51
S. D.	6 ± .82
Mean	38.2 ± 1.15

R 16. SARISHA S. N. GIRLS' SCHOOL, 24 PARGANAS (Fine Arts)

No. of Pupils	38
Range of Score	20-49
S. D.	7 ± .92
Mean	36.2 ± 1.30

R 17. ITACHUNA HIGH SCHOOL, HOOGHLY (Agricultural)

No. of Pupils	40
Range of Score	26-57
S. D.	6.7 ± .88
Mean	42.86 ± 1.49

R 18. SHYAMSUNDAR R. L. VIDYALAYA, BURDWAN (Agricultural)

No. of Pupils	40
Range of Score	24-59
S. D.	8 ± 1.1
Mean	41 ± 2.0

I 19. BURDWAN MUNICIPAL GIRLS' SCHOOL (Fine Arts)

No. of Pupils	39
Range of Score	26-53
S. D.	6.44 ± .88
Mean	39.07 ± 1.5

U 20. MIDNAPORE COLLEGIATE SCHOOL (Commercial)

No. of Pupils	42
Range of Score	28-55
S. D.	6 ± .77
Mean	42.33 ± 1.34

C 21. GIAGUNGE R. V. S. VIDYALAYA, MURSHIDABAD (Humanities)

No. of Pupils	38
Range of Score	28-55
S. D.	6.12 ± .84
Mean	41.64 ± 1.42

R 22. BISHNUPUR HIGH SCHOOL (Humanities)

No. of Pupils	38
Range of Score	26-57
S. D.	8.8 ± 1.2
Mean	40.22 ± 2.05

R 23. MALLARA SCHOOL (Agricultural)

No. of Pupils	40
Range of Score	28-55
S. D.	4.4 ± .57
Mean	42.7 ± .98

R 24. BANERJEEDANGA HIGH SCHOOL, MIDNAPORE (Agricultural)

No. of Pupils	42
Range of Score	20-54
S. D.	7.2 ± 1.12
Mean	36.5 ± 1.87

U 25. BHATPARA HIGH SCHOOL, 24 PARGANAS (Humanities)

No. of Pupils	46
Range of Score	24-51
S. D.	6 ± .86
Mean	38.1 ± 1.46

Cu 26. NABADWIP BANGABANI GIRLS' HIGH SCHOOL (Humanities)

No. of Pupils	38
Range of Score	26-53
S. D.	5.7 ± .78
Mean	39.9 ± 1.32

Cu 27. KRISHNANAGORE COLLEGIATE SCHOOL, NADIA (Science)

No. of Pupils	38
Range of Score	24-53
S. D.	7.2 ± .88
Mean	37.2 ± 1.75

U 28. KONNAGORE HIGH SCHOOL, HOOGHLY (Science)

No. of Pupils	40
Range of Score	22-51
S. D.	7.2 ± 1.09
Mean	35.1 ± 1.84

I 29. VIVEKANANDA INSTITUTION, HOWRAH (Science)

No. of Pupils	40
Range of Score	25-56
S. D.	6.3 ± 1.71
Mean	37.5 ± 1.81

R 30. MALDAHA ZILA SCHOOL (Science)

No. of Pupils	44
Range of score	22-51
S. D.	5.7 ± .85
Mean	40.5 ± 1.96

(*NB* : The scores indicated in these tables are Interest Scores).

U—Urban
I—Industrial
C—Commercial
Cu—Cultural or residential
R—Rural

Appendix II

(SCIENTIFIC BASIS OF GUIDANCE)

TESTS

INTEREST INVENTORY

Sub Test No. 1.

(Original)

Direction : There are questions below. Against each item there are three columns, Yes, (?) and No.

Underline yes, if you prefer the item and no, if you do not. If you are doubtful, underline (?)

Group A

1. Do you draw picture after your school hours ?
2. Do you read the story of inventions after your school hours ?
3. Do you take account of the daily marketing expenses after your school hours ?
4. Do you mend damaged watch after your school hours ?
5. Do you work in your garden after your school hours ?
6. Do you write an essay after your school hours ?
7. Do you cultivate vegetables in your garden on a holiday ?
8. Do you answer difficult questions on grammar ?
9. Do you compose poems on a holiday in a lonely atmosphere ?
10. Do you study the share-market from newspapers on a holiday ?
25. Do you decorate your room with pictures on a rainy day ?
26. Do you make any economic plan on a rainy day ?
27. Do you get the best seeds out of your stock on a rainy day ?
28. Do you read any thoughtful essay ?
29. Do you mend damaged torch-lights ?
30. Do you read essays on scientific inventions in different countries attentively ?
31. Do you solve arithmetical problem in your school library if you get time for a while ?
32. Do you make pen-stand of wood in the craft room of your school ?
33. Do you draw up your future plan on the basis of balance-sheet prepared in connection with any festival ?
34. Do you spend your time on drawing pictures in a lonely place if you get time ?
35. Would you be curious about acids available in the laboratory ?
36. Do you spend your time on gardening ?
37. Do you spend your time on typewriting at home ?
38. Do you spend your time on reading books on science ?
39. Do you spend your time on drawing ?
40. Do you spend your time on handling the machinery ?
41. Do you spend your time on reading history ?
42. Do you spend your time on cultivating flowers and fruits ?
43. Do you spend most of your time on solving difficult sums ?
44. Do you read literary books ?
45. Do you draw sketches of the machineries ?
46. Do you read the stories of scientific inventions ?
47. Do you handle a box full of seeds ?
48. Do you devote most of your time on spinning wheels ?
49. Do you buy pictures if you get some money ?
50. Do you buy tools if you get some money ?

51. Do you buy flower seeds if you get some money?
52. Do you buy some books of poems if you get some money?
53. Do you spend on biographies of the scientists if you get some money?
54. Do you buy books on accounting if you get some money?
55. Have you published your social essays in your school magazine or any other magazine?
56. Do you work regularly in the garden in your house or school?
57. Do you visit factories?
75. Would you prefer to attend geography class to any other states?
76. Do you find the book or plants dull?
77. Do you give up small tools easily if you get them once?
78. Would you like to know more about geology?
79. Do you usually try to examine parts of a machine you come across?
80. Do you spend most of your time on doing sums?
81. Do you spend all your leisure time on your kitchen garden?
82. Do you buy out of your savings something with the hope of future gain?
83. Do you often spend on plants for your home?
84. Do you occasionally keep in touch with a shop for knowing its profit or loss?

Sub Test No. 1. (Revised)

Direction: There are twenty groups of questions given below. In each group there are three questions. Mark (3) against the items you like most and (1) against the items you like least. Mark (2) against the item to which you are almost indifferent. There may be some situations which may appear to be unusual and in those cases you should remember that the situations are abstract and you will have to make a selection out of those. So respond to every item freely in the light of your own experience:

Group A

1. Would you sit to draw a picture at the end of the school hours? ( )
2. Would you sit upon a watch at the end of your school hours? ( )
3. Would you sit to keep accounts of your family after your school hours? ( )

Group B

1. Do you spend your time with small tools on a holiday? ( )
2. Do you keep a watch on the share market on a holiday? ( )
3. Would you try to know about plants on an excursion to any farm on a holiday? ( )

Group C

1. Do you go to a shop or a bank nearly to know about accounts, if you get a half-holiday in your school? ( )
2. Do you work in your garden, if you get a half-holiday in your school? ( )
3. Would you sit to write an essay in a half-holiday in your school? ( )

Group D

1. Do you get the best seeds out of your stock on a rainy day? ( )
3. Do you spend your time reading thoughtful essays on a rainy day? ( )
3. Do you read the lives of scientists attentively on a rainy day? ( )

Group E

1. Do you look into your sums (worked out) if you get a holiday? ( )
2. Do you handle apparatus and acids in a laboratory if you get a holiday? ( )
3. Do you draw a picture in a lonely place if you get a holiday? ( )

Group F

1. Do you look into science journals in a book stall near by when the train is late in a big station? ( )
2. Do you draw a picture when the train is late in a big station? ( )
3. Do you observe the parts of an engine when the train is late in a station? ( )

Group G

1. Do you solve questions on grammar when you get enough leisure? ( )
2. Do you read about plants in your free moments? ( )
3. Do you keep accounts of your petty expenses during your leisure? ( )

Group H

1. Do you go for a visit to a factory? ( )
2. Would you be ready to play a role in a theatrical performance in a holiday? ( )
3. Would you take up a plot of land for cultivation on a holiday? ( )

Group I

1. Would you try to know about trade and commerce of a place while on excursion there? ( )
2. Do you collect historical and social facts of the place while on an excursion there? ( )
3. Do you collect scientific data of a new area while on an excursion there? ( )

Group J

1. Do you work in your garden regularly at your leisure time? ( )
2. Do you work with tools at your leisure time? ( )
3. Do you write story for your school magazine at your leisure time? ( )

Group K

1. Do you read books on world literature if you get time? ( )
2. Do you spin on wheels and try to earn something if you get time? ( )
3. Do you decorate your rooms with pictures if you get time? ( )

Group L

1. Do you purchase books on scientific inventions if you get some money? ( )
2. Do you purchase seeds for plantation, if you get some money? ( )
3. Do you purchase some small instruments if you get some money? ( )

Group M

1. Do you spend most of your time on drawing pictures or photography? ( )
2. Do you spend most of your time on reading books on science? ( )
3. Do you spend most of your time on gardening? ( )

Group N

1. Do you examine machinery in your spare time? ( )
2. Do you read books on the history of civilization in your leisure time? ( )
3. Do you make dolls or models with clay in your spare time? ( )

Group O

1. Do you spend most of your time on reading critical essays? ( )
2. Do you spend most of your time on reading about plants? ( )
3. Do you spend your time on reading books on scientific topics? ( )

Group P

1. Do you like to be a gardener or a cultivator? ( )
2. Do you often go to an art gallery? ( )
3. Do you attend classes on commercial geography more than those on other subjects? ( )

Group Q

1. Do you purchase books on literature, if you get some money? ( )
2. Do you enquire about the business affairs of a shop if you go there as a purchaser? ( )
3. Do you examine the parts of a machine if you have a chance to see? ( )

Group R

1. Do you read books of biology? ( )
2. Do you draw a sketch of a machine? ( )
3. Do you purchase cash books regularly to keep accounts? ( )

Group S

1. Do you generally read biographies of the great artists? ( )
2. Would you like to know about the leading business men? ( )
3. Do you usually purchase plants or seeds in a fair? ( )

Group T

1. Do you purchase screw drivers or such other small tools if you have some money? ( )
2. Do you give more attention to the old temples or historical relics of a particular place? ( )
3. Do you read books on science more than those of other subjects? ( )

Sub-Test No. 2 (Original)

Direction: Try to answer the following questions:

Question

1. What race did reign in India for the shortest period?
2. What are the necessary manures for cabbage?
3. Who was the famous Moghul artist?
4. What books should be maintained for keeping proper accounts of a business concern?
5. What are the sub-divisions of physics?
6. What is the function of a piston of a locomotive engine?
7. Name the Nobel prize winner in science in India.
8. When should the roots of the trees be exposed?
9. What part of the face of an image receives the finishing touch of an artist?
10. How is the monitary transaction made in foreign trade?
11. What is the contribution of Einstein?
12. How many wheels are there in a watch?
13. For what is Pythagoras famous?
14. What sorts of soil should be chosen for jute cultivation?
15. What are the different kinds of cheques?
16. What is the most convenient shape of things for use in mechanical field.
17. Who among the poets has said "Man is above all"?
18. What are the plants which grow well in darkness?
19. Whom do you like most among the western artists?

20. What do you mean by Balance Sheet ?
21. Is it the front wheel or hind wheel with which the engine of a bus is connected ?
22. What are the steps you would take for preserving plants from damage by insects ?
23. How many kinds of visual arts are there ?
24. What is the function of an Auditor ?
25. What is the medium of transmission of sound in a radio ?
26. What is the voltage of a single cell used in torch-lights ?
27. How many times a year can paddy be grown in a field ?
28. What contrast colour makes black brightest ?
29. How many kinds of limited firms are there ?
30. What are the constituents of an atom ?
31. For what type of art is southern India famous ?
32. What specific branch of mathematics is mostly applied in science ?
33. What will be the position of a railway signal when the wire connecting it is broken?
34. Who did try to give an economic interpretation of society ?
35. Which of the books about social history of the Bengalee is recent ?
36. What is the position of a needle used in a sewing machine ?

Sub-Test No. 2. (Revised)

Direction : Try to answer in respective blanks the following questions after you have read them thoroughly—

Question

1. What are the necessary manures for cabbages?
2. What are the sub-divisions of physics?
3. Name the Nobel prize-winners in science in India.
4. When should the roots of the trees be exposed?
5. What part of the face of an image receives the finishing touch by an artist?
6. How is the monetary transaction made in foreign trade?
7. What is the contribution of Einstein?
8. Why is Pythagoras famous?
9. What are the different kinds of cheques?
10. What sorts of soil should be chosen for jute cultivation?
11. What is the most convenient shape of things for use in mechanical field?
12. Who among the poets in Bengal has said "Man is above all?"
13. Whom do you like best among the western-artists?
14. Is it the front wheel or hind wheel with which the engine of a bus is connected ?
15. How many kinds of visual arts are there?
16. What is the function of an auditor?
17. What voltage does a single cell used in a torch light contain?
18. How many times a year can paddy be grown in a field?
19. How many kinds of limited firms are there?
20. What are constituents of an atom?
21. For what type of art is southern India famous?
22. What will be the position of a railway signal when the wire connecting it is broken?
23. Who did try to give an economic interpretation of society?
24. What is the position of a needle used in a sewing machine?

Sub-Test No. 3

(Original)

Original Inventory with serial nos. revised or modified and shown in the item analysis.

Direction. In each page there are pictures and works. From each pair select one according to your choice.

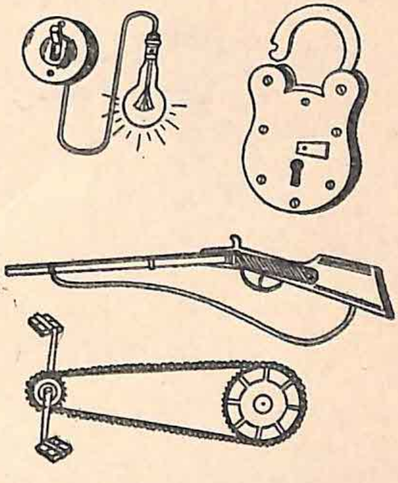
1. Fill up the gaps :

OUR GROWING HUMAN FAMILY

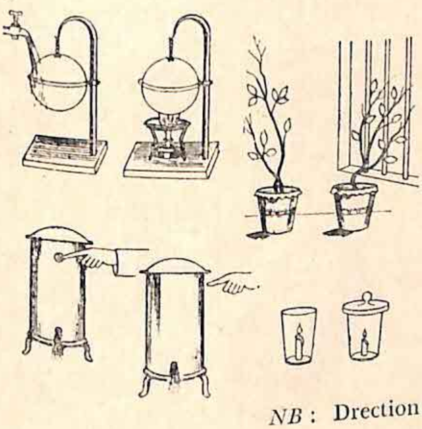
WRITERS NAME

PERIOD OF COMPOSITION

2. Put cross (x) with red pencil against the mistakes in the things mentioned below.



3. There are four pairs of pictures below. In one of each pair there is something wrong. Mark the mistake with cross (x).



4. Fill up the gaps :

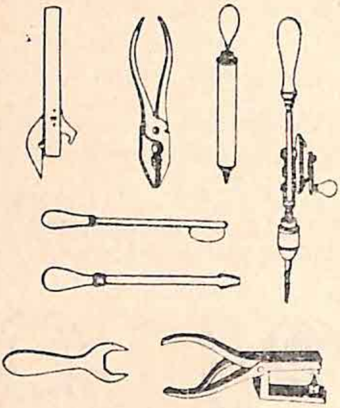
CAPTIVE LADY

WRITERS NAME

PERIOD OF COMPOSITION

NB : Drection is not necessary here.

5. Write in brief the main uses of the following instruments on their body.

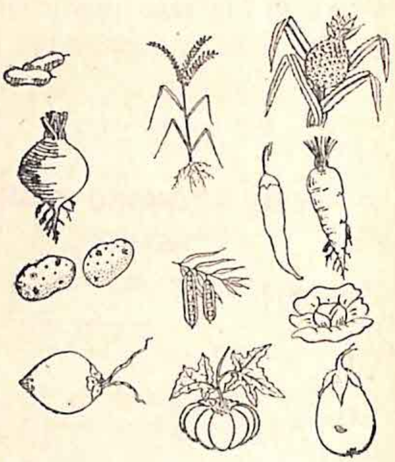


7. Fill up the gaps :

Winner of Nobel Prize for Literature

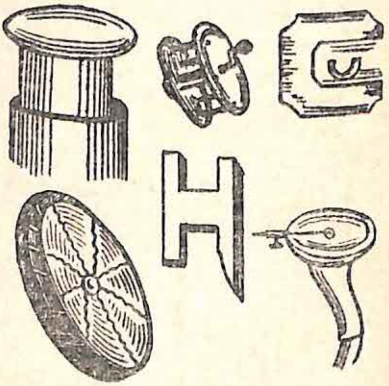
1956

6. Mark with number naming the kind of soil in which the plants given below grow more. Put the number to refer each respective soil on the picture.

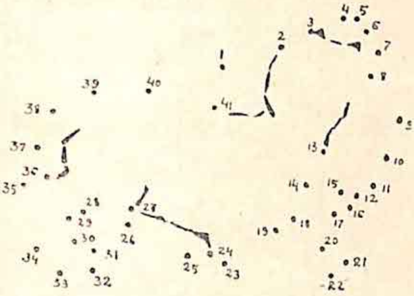


1. Sands, 2. Gravels, 3. Alluvial, 4. Clay, 5. Loam.

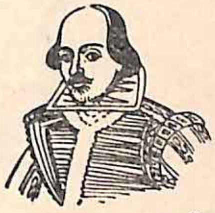
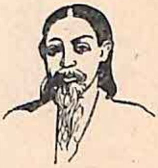
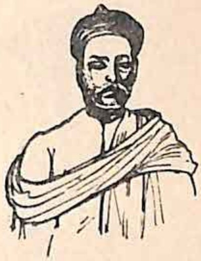
8. What are the objects of which the following are parts (or where do you find the following objects).



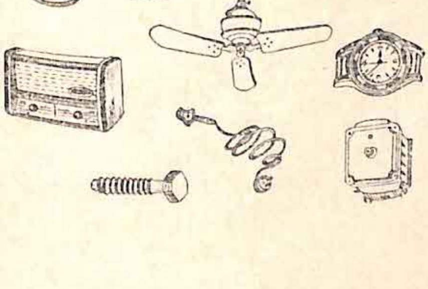
9. There are some points below and each point is marked with a number. What will be the figure if the numbers are added up.



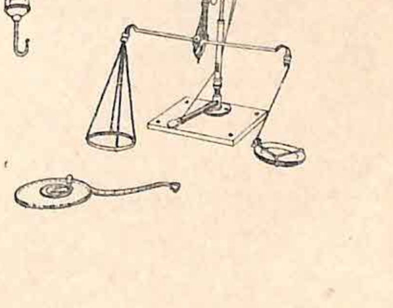
10. There are pictures of three great men below. Write the name of an essay or a book composed by each of them just on the right hand side of the picture.

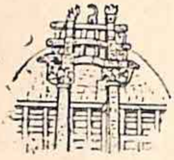
11. There are some pictures below on the right and the left. Mark by the same number the related things appearing on the right and left hand side.

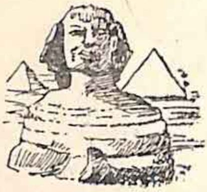


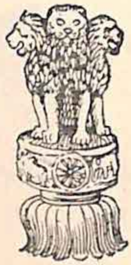
12. There are some pictures of some scales below. State on each the purpose for which they are made.



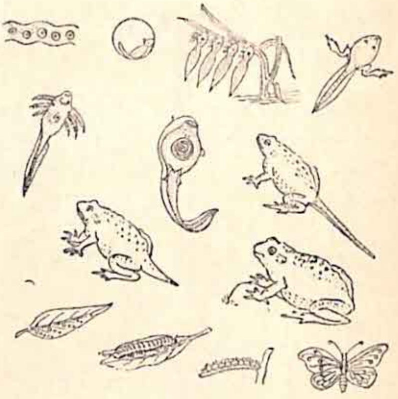
13. There are some monuments of historical importance. State against each the approximate date of its erection and place where these are found.



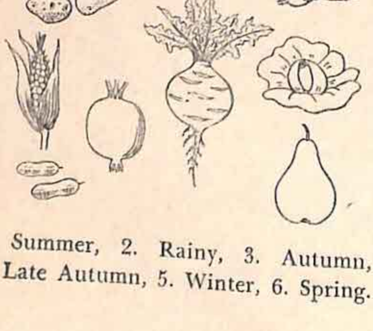




14. There are pictures of the different stages of life of two creatures below. Mark the stages of creation of the first type by 1,2,3,4, etc. and the second type by A,B,C,D, etc.

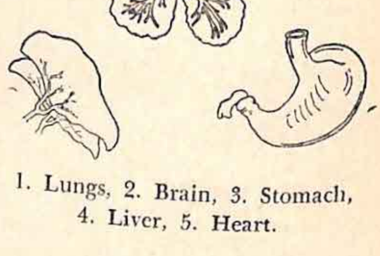


15. Mark by number the plants that grow more in different seasons. For example, mark 1 against the crops growing in summer.



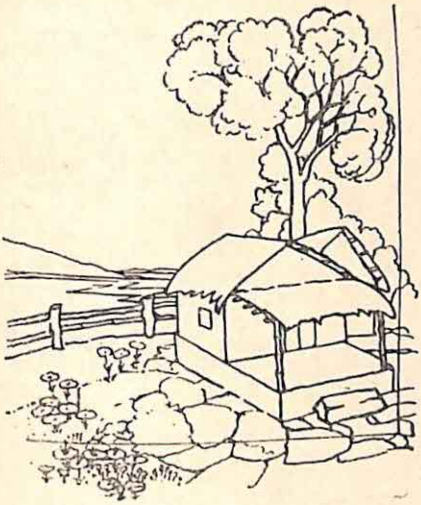
1. Summer, 2. Rainy, 3. Autumn, 4. Late Autumn, 5. Winter, 6. Spring.

16. There are some organs of the body and some names marked with numbers. Mark each of them with their corresponding numbers.

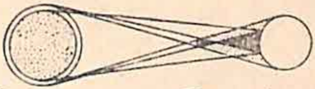


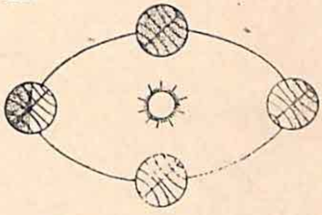
1. Lungs, 2. Brain, 3. Stomach, 4. Liver, 5. Heart.

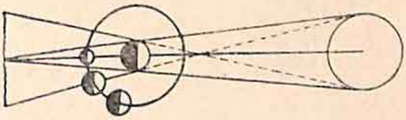
17. There is a picture below. Apply appropriate colours with coloured pencils in appropriate places.



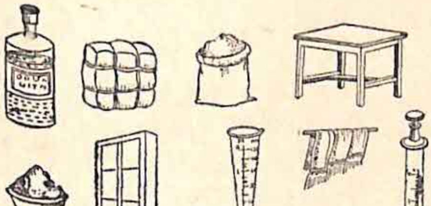
18. There are three diagrams below. Put the implication of each on the respective diagrams.



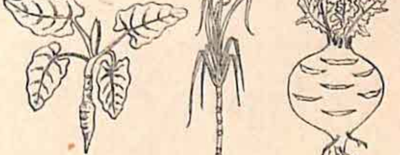




19. In which business the things pictured below are used? Mark the same number against things used for the same business.

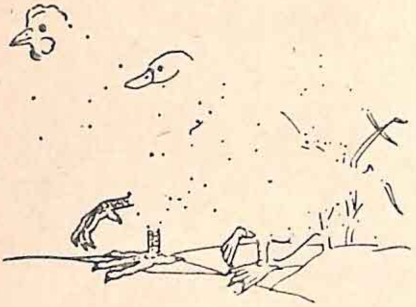


20. Mark the respective plants with the number of the manure used in each case.

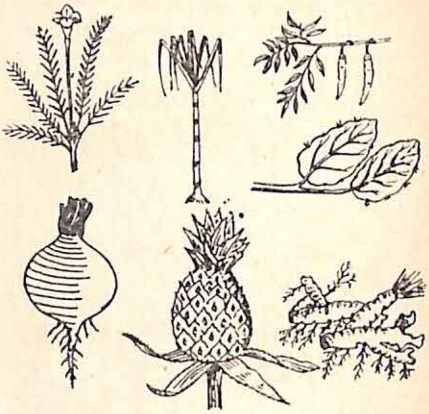


1. Cowdung, 2. Compost, 3. Ashes, 4. Mustard Cake.

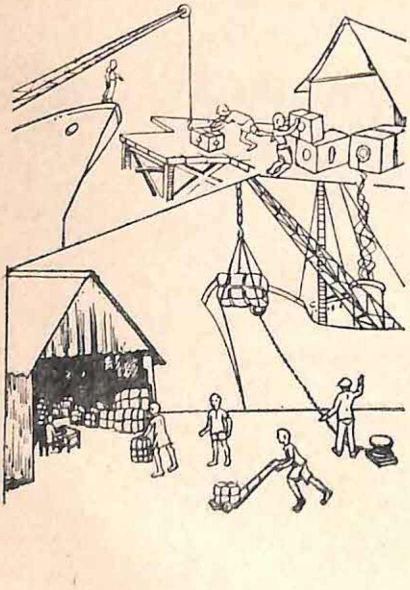
21. Join the dots in such a way that they may form two different birds.



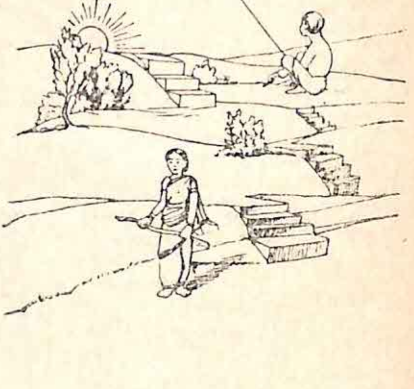
22. Write down the names of the chief parts of the following trees which, if planted, will cause the growth of new trees.



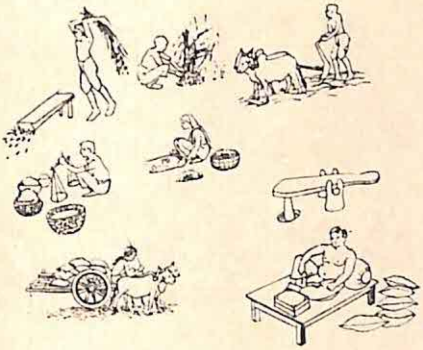
23. Write in short what the following picture implies if it has any concern with trade and commerce.



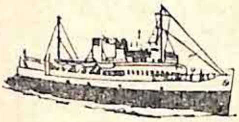
24. Mark the places with cross(x) where there are mistakes.

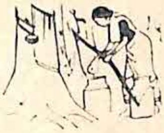


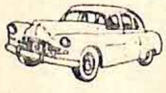
25. In the following picture the different stages involved in a trade has been illustrated. Mark these stages with number in order of occurrence.

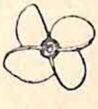


27. There are some diagrams below. Put the implication of each of the respective diagrams.

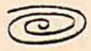


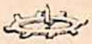


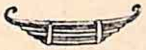


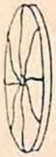


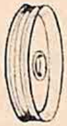
26. There are some springs and wheels below. Write where they are used.

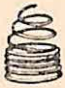


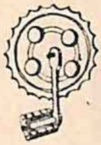




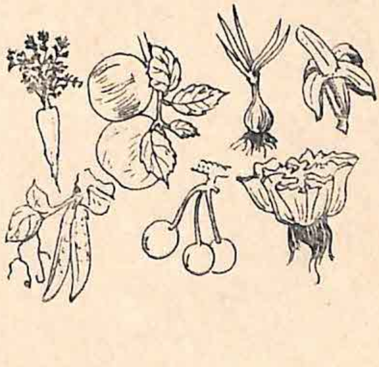




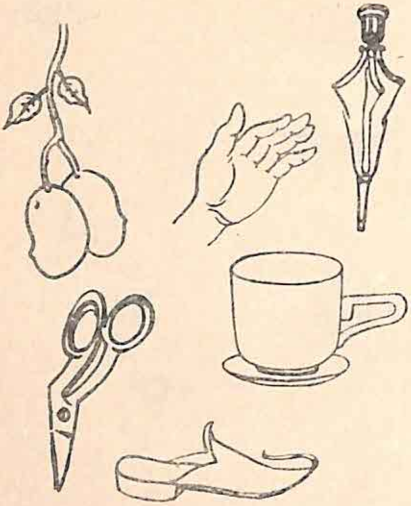




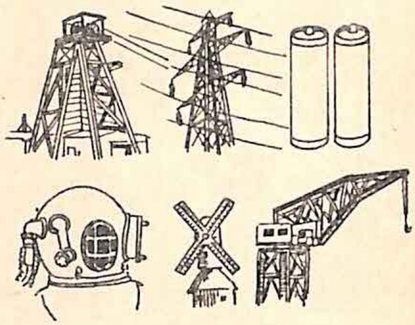
28. Mark on the following the most appropriate place (viz. water, ground, under ground and above ground) where they grow naturally.



29. Cross out the mistakes on the exact spots in the picture below.



30. There are three pictures below, on the up and the down. State by number the relation of things on the upside with those of the downward side.

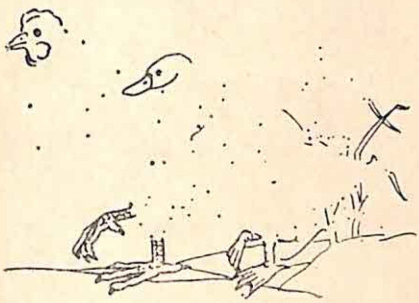


Sub-Test No. 3

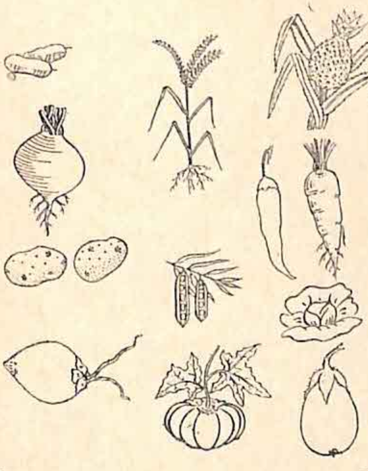
(Revised)

Direction. In each page there are directions for doing the works on items arranged side by side in pairs. From each pair select one according to your choice.

Join the dots in such a way that they form two different birds.

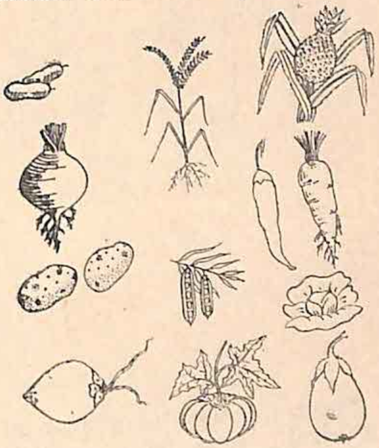


Mark with number naming the kind of soil in which the plants given below grow more. Put the number to refer each respective soil on the picture.



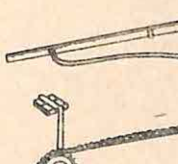
1. Sand, 2. Gravels, 3. Alluvial, 4. Clay, 5. Loam.

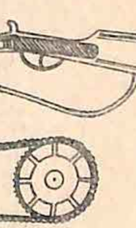
Mark with number naming the kind of soil in which the plants given below grow more. Put the number to refer each respective soil on the picture.



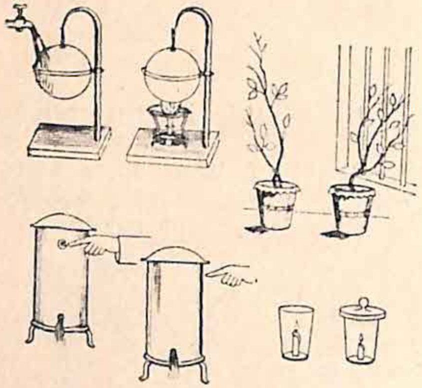
1. Sands, 2. Gravels, 3. Alluvial, 4. Clay, 5. Loam.

Put cross (x) with red pencil against the mistakes in the things mentioned below.

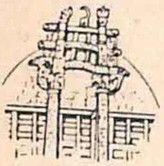


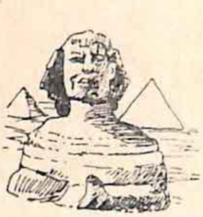


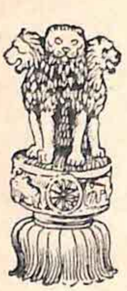
There are four pairs of pictures below. In one of each pair there is something wrong. Mark the mistake with cross (x).



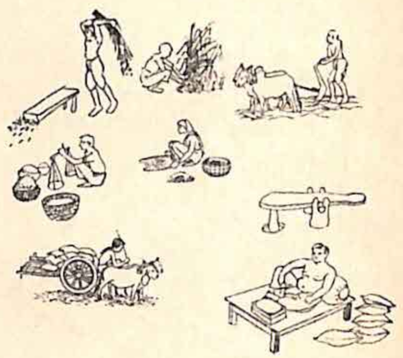
There are some monuments of historical importance. State against each the approximate date of its erection and place where these are found.



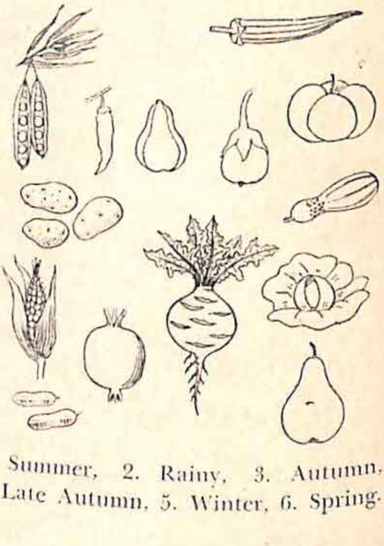




In the following picture the different stages involved in a trade have been illustrated. Mark these stages with number in order of occurrence.

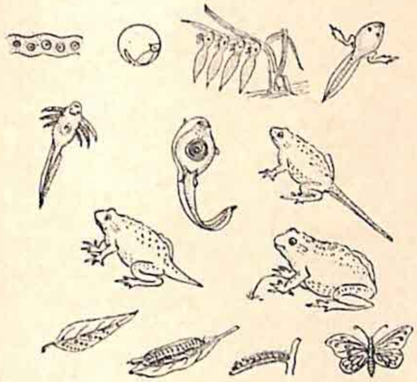


Mark by number the plants that grow more in different seasons. For example, mark 1 against the crop grown in summer.

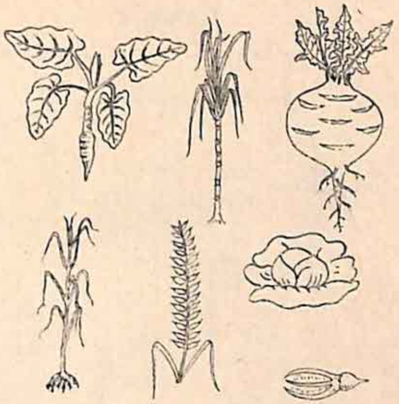


1. Summer, 2. Rainy, 3. Autumn. 4. Late Autumn. 5. Winter. 6. Spring.

There are pictures of the different stages of life of two creatures below. Mark the stages of creation of the first type by 1, 2, 3, 4, etc. and the second type by A, B, C, D, etc.

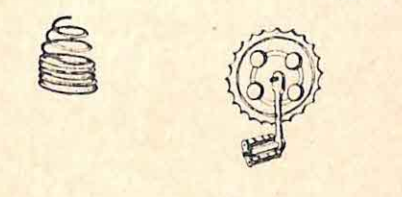


Mark the respective plants with the number of the manure used in each case.



1. Cowdung, 2. Compost, 3. Ashes, 4. Mustard Cake.

There are some springs and wheels below. Write where they are used.



There are pictures of the different stages of life of two creatures below. Mark the stages of creation of the first type by 1, 2, 3, 4, etc. and the second type by A, B, C, D, etc.

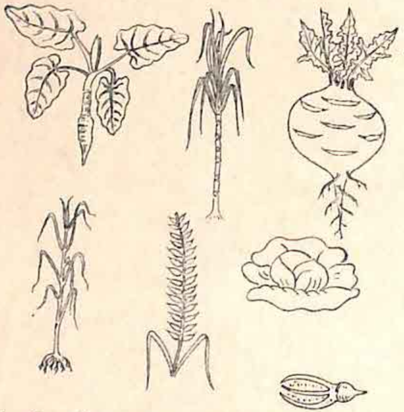
Fill up the gaps.

OUR GROWING HUMAN FAMILY

WRITERS NAME ☐

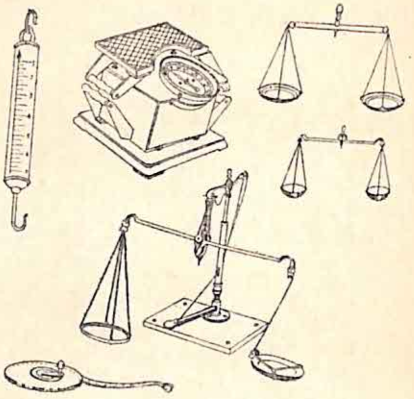
PERIOD OF COMPOSITION ☐

Mark the respective plants with the number of the manure used in each case.

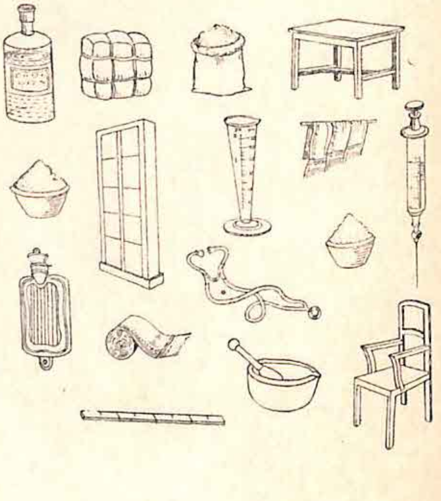


1. Cowdung, 2. Compost, 3. Ashes, Mustard Cake.

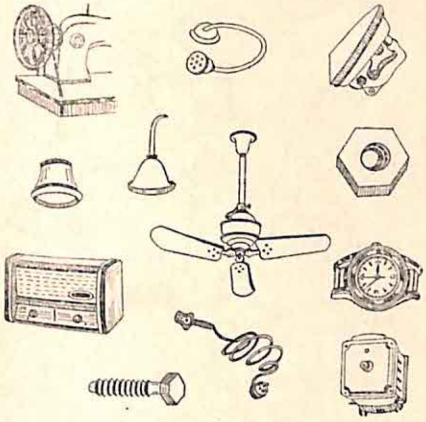
There are some pictures of some scales below. State against each the purpose for which they are made.



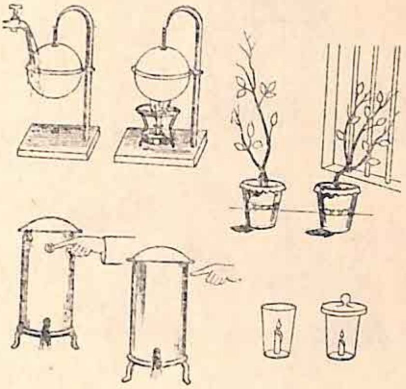
In which business the things pictured below are used? Mark the same number against things used for the same business.



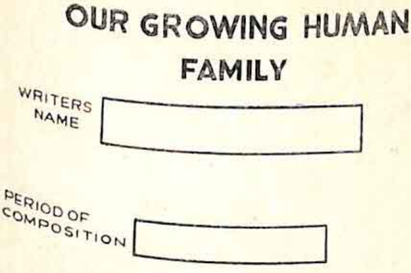
There are some pictures below on the right and the left. State by number the relation of things on the right with those of the left.



There are four pairs of picture below. In one of each pair there is something wrong: Mark the mistakes with cross (X).



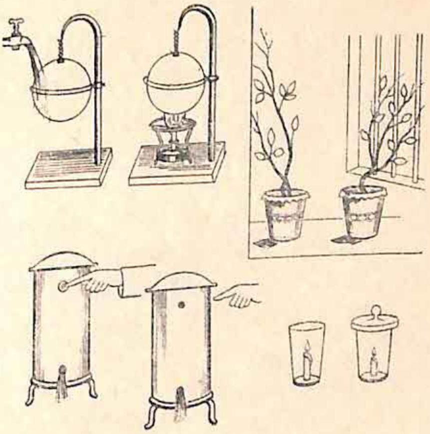
Fill up the gaps.


OUR GROWING HUMAN FAMILY

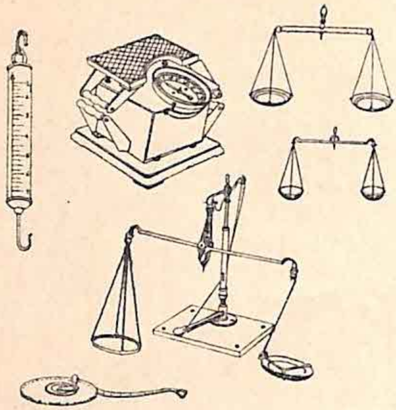
WRITERS NAME

PERIOD OF COMPOSITION

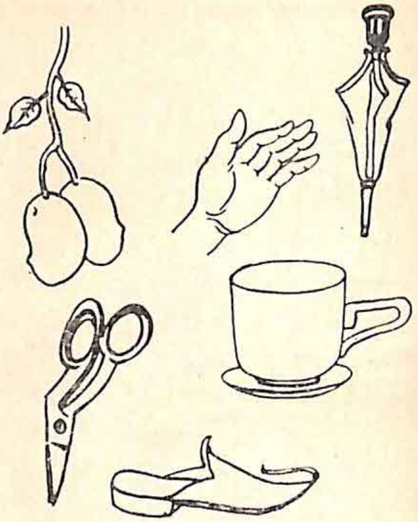
There are four pairs of pictures below. In one of each pair there is something wrong. Mark the mistakes with cross (x).



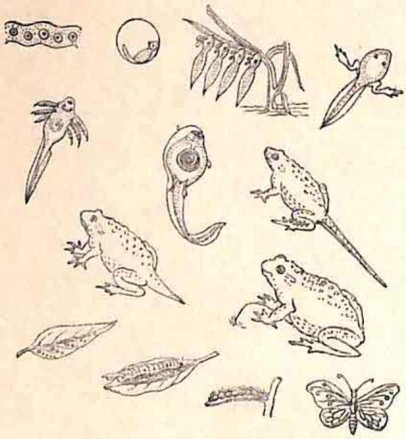
There are some pictures of some scales below. State against each the purpose for which they are made.



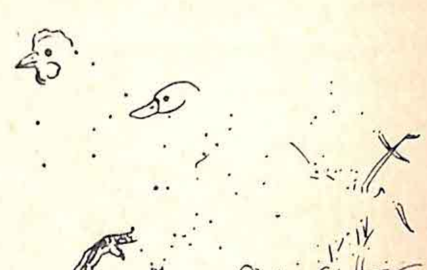
Cross out the mistakes on the exact spots in the picture below.



There are some pictures of different stages of life of two creatures below. Mark the stages of creation of the first type by 1, 2, 3, 4 etc. and the second type by A, B, C, D etc.

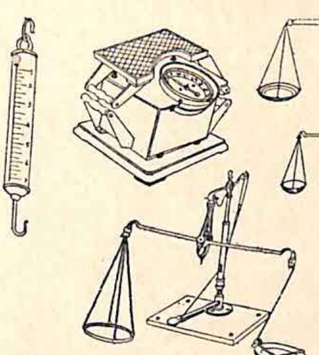


Join the dots in such a way that they may form two different birds.

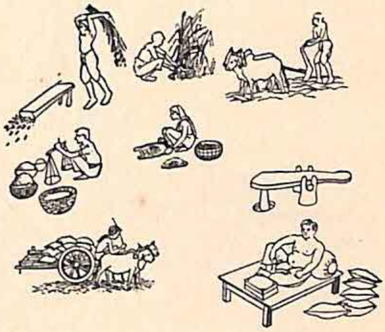


There is a picture below. Apply appropriate colour with coloured pencils in appropriate place.

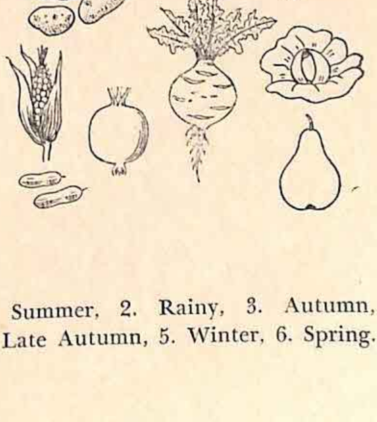
There are some pictures of scales below. State against each the purpose for which they are made.



In the following pictures the different stages involved in a trade have been illustrated. Mark these stages with number in order of occurrence.

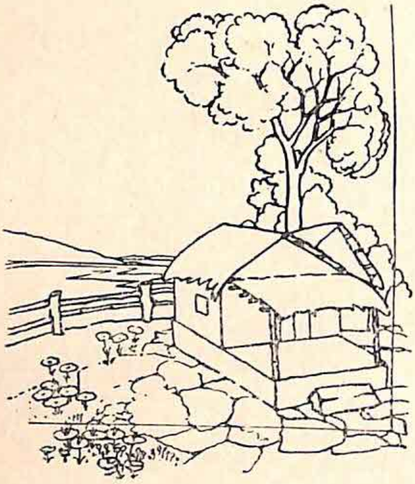


Mark by number the plants that grow more in different seasons. For example, mark 1 against the crop grown in summer.

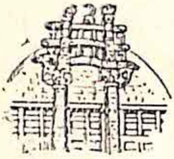


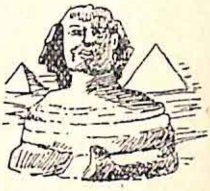
1. Summer, 2. Rainy, 3. Autumn,
4. Late Autumn, 5. Winter, 6. Spring.

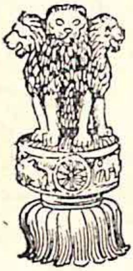
There is a picture below. Apply appropriate colours with coloured pencils in appropriate places.



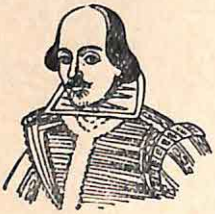
There are some monuments of historical importance. State against each the approximate date of its erection and the place where these are found.

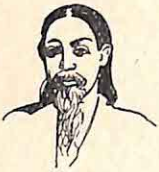


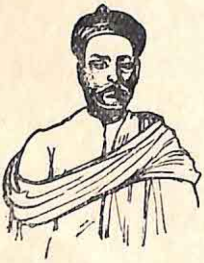




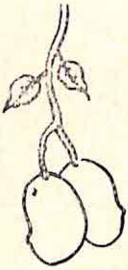
There are pictures of three great men below. Write the name of an essay or a book composed by each of them just on the right hand side of the picture.

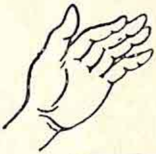


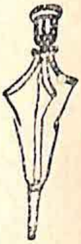


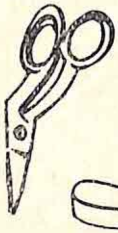


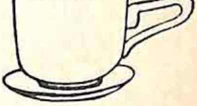
Put cross (x) with red pencil against the mistakes in the things mentioned below.

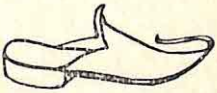




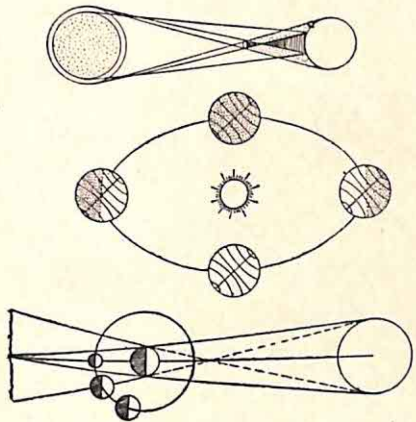




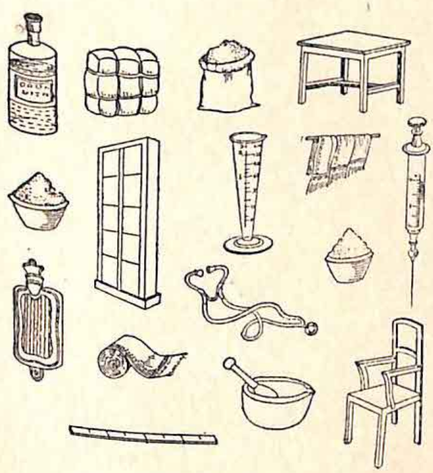




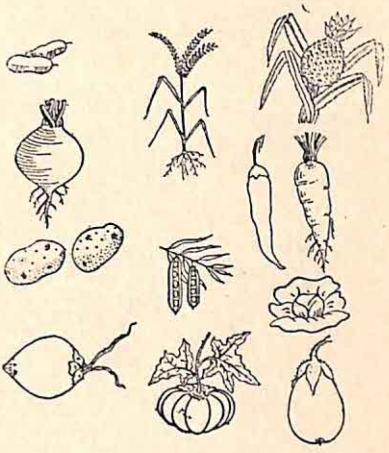
There are three diagrams below. Put the implication of each of the respective diagrams.



In which business the things pictured below are used? Mark the same number against things used for the same business.

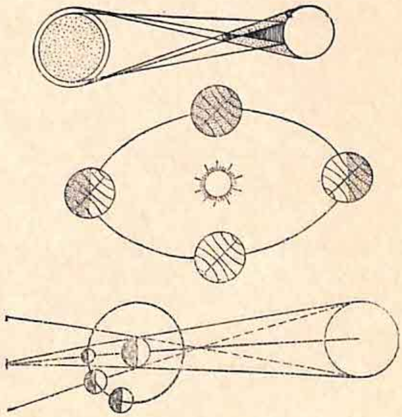


Mark with number naming the kinds of soil in which the plants given below grow more. Put the number to the respective soils on the picture.

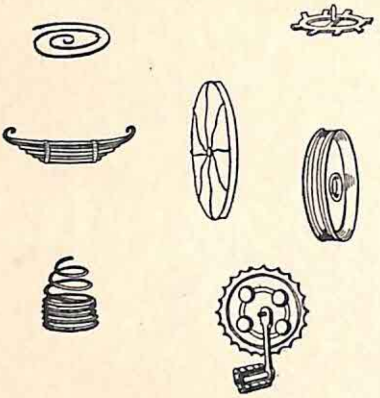


1. Sands, 2. Gravels, 3. Silts, 4. Clay, 5. Peats.

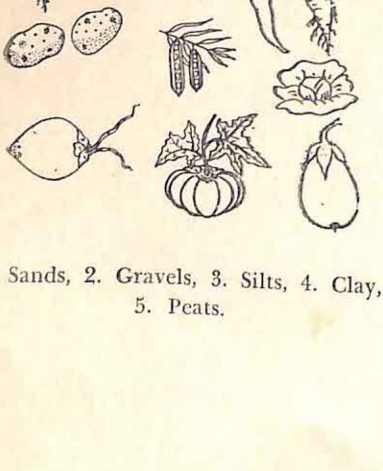
There are three diagrams below. Put the implication of each on the respective diagrams.



There are some springs and wheels below. Write where they are used.

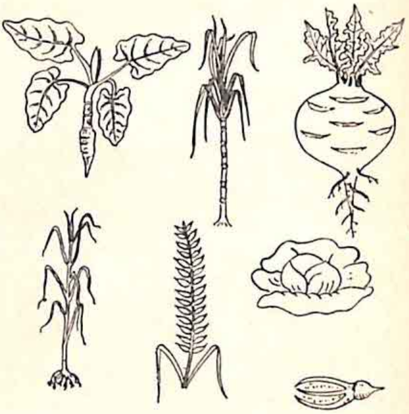


Mark with number naming the kind of soil in which the plants given below grow more. Put the number to refer each respective soil on the picture.



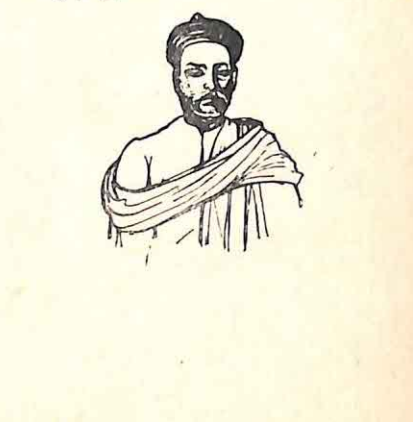
1. Sands, 2. Gravels, 3. Silts, 4. Clay, 5. Peats.

Mark the respective plants, with the number of the manure used in each case.

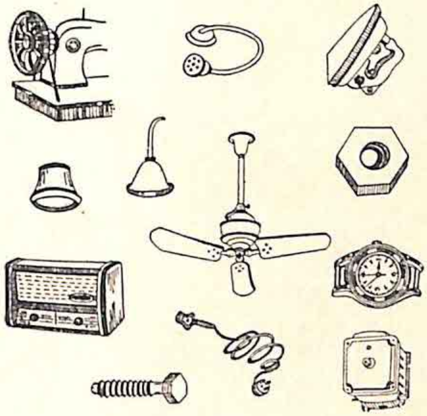


1. Cowdung, 2. Compost, 3. Ashes, 4. Mustard Cake.

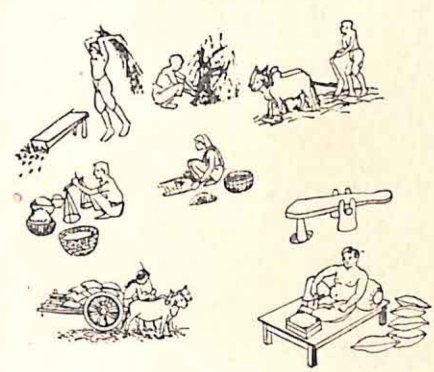
There are pictures of three great men below. Write the name of an essay or a book composed by each of them just on the right hand side of the respective pictures.



There are some pictures below, on the right and the left. State by numbers the relation of things on the right with those on the left.



In the following pictures the different stages involved in a trade have been illustrated. Mark these stages with number in order of occurrence.



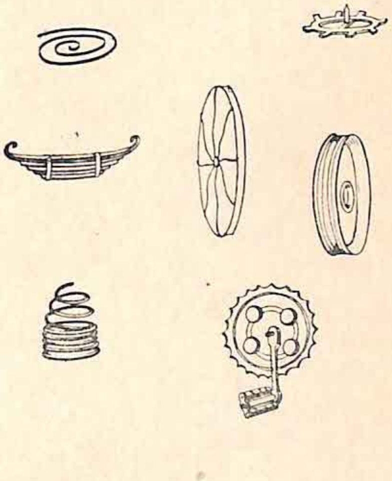
Fill up the gaps.

OUR GROWING HUMAN FAMILY

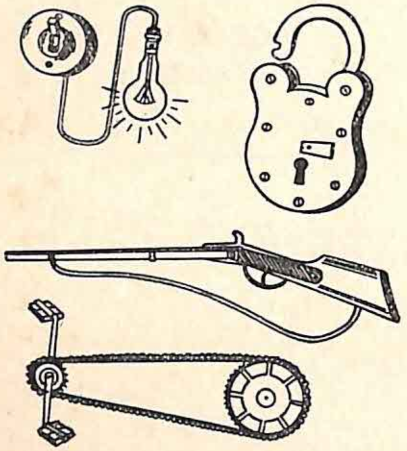
WRITERS NAME ☐

PERIOD OF COMPOSITION ☐

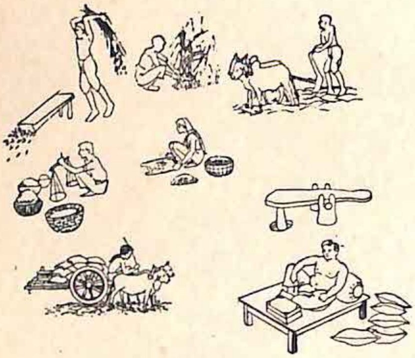
There are some springs and wheels below. Write where they are used.



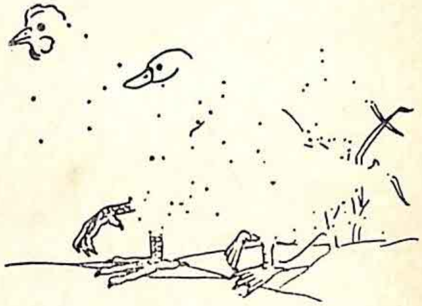
Put cross (x) with red pencil against the mistakes in the things mentioned below.



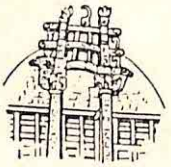
In the following picture the different stages involved in a trade has been illustrated. Mark these stages with number in order of occurrence.

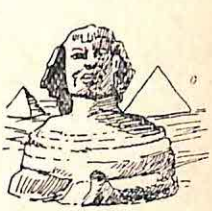


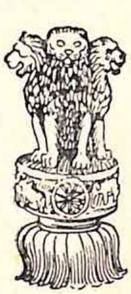
Join the dots in such a way that they form two different birds.



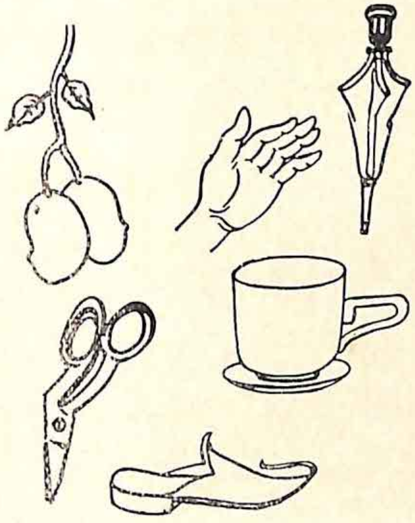
There are some monuments of historical importance. State against each the approximate date of its erection and the place where these are found.



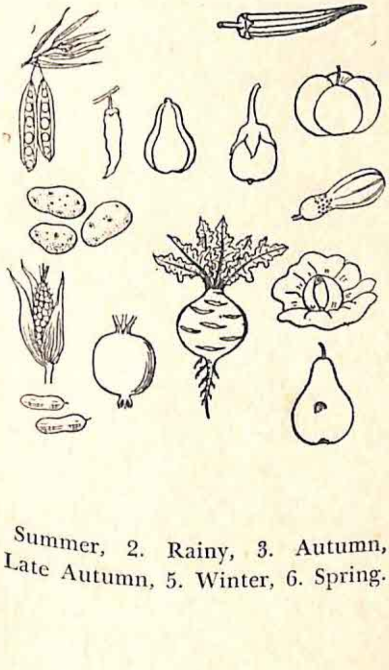




Cross out the mistakes on the exact spots in the pictures below.

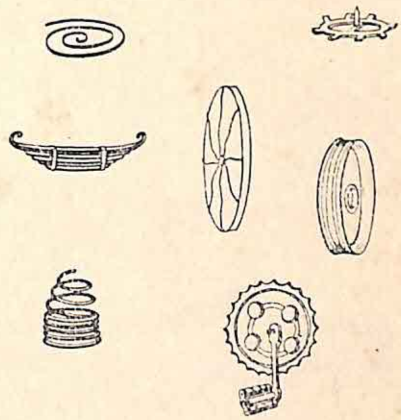


Mark by number the plants that grow more in different seasons. For example, mark 1 against the crops that grow in summer.

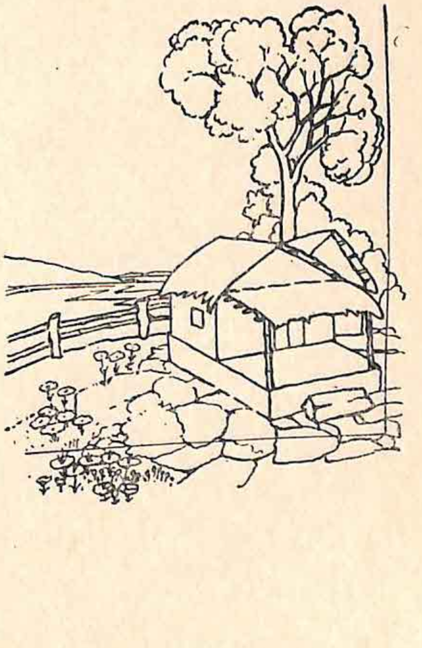


1. Summer, 2. Rainy, 3. Autumn, 4. Late Autumn, 5. Winter, 6. Spring.

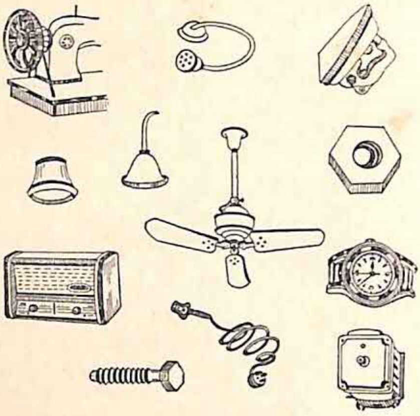
There are some springs and wheels below. Write where they are used.



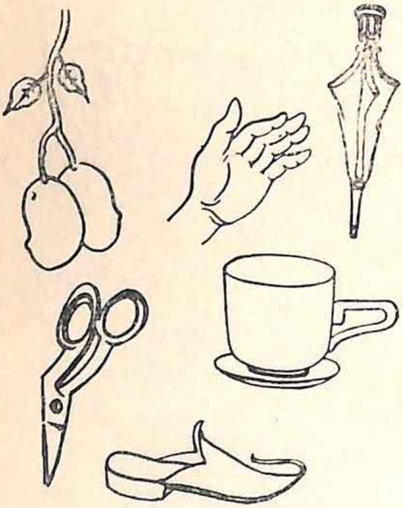
There is a picture below. Apply appropriate colours with coloured pencils in appropriate places.



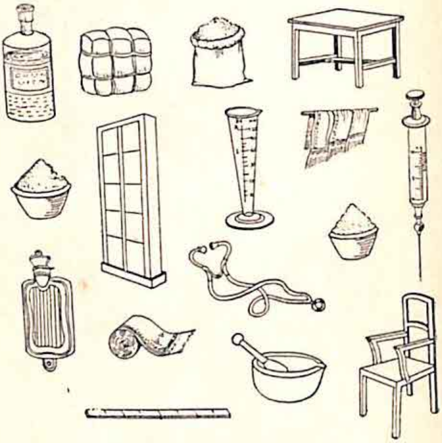
There are some pictures below. State by number the relation of things on the right with those on the left.



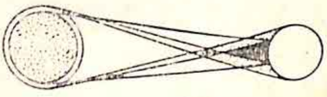
Mark the places of mistakes with cross (x) mark on each in the picture given below.

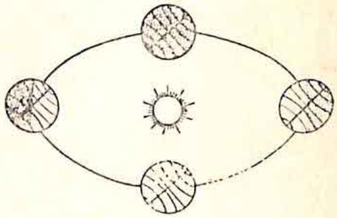


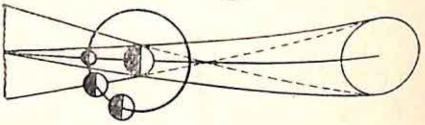
In which business the things pictured below are used? Mark the same number against things used for the same business.



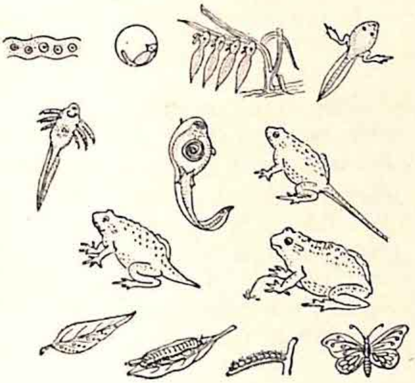
There are three diagrams below. Put the implication of each on the respective diagrams.



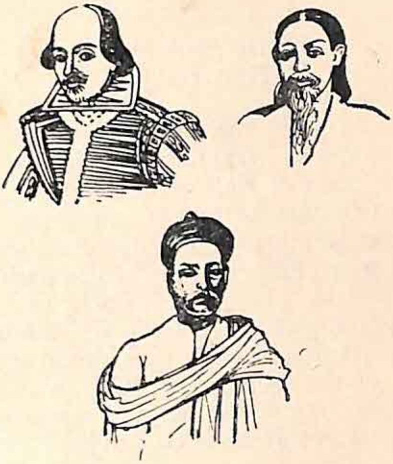




There are pictures of the different stages of life of two creatures below. Mark the stages of creation of the 1st type by 1, 2, 3, 4 etc. and the 2nd type by A, B, C, D etc.



There are pictures of three great men below. Write the name of an essay or a book composed by each of them just on the right hand side of the pictures.



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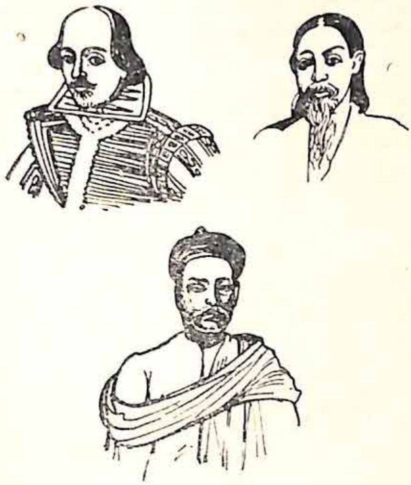
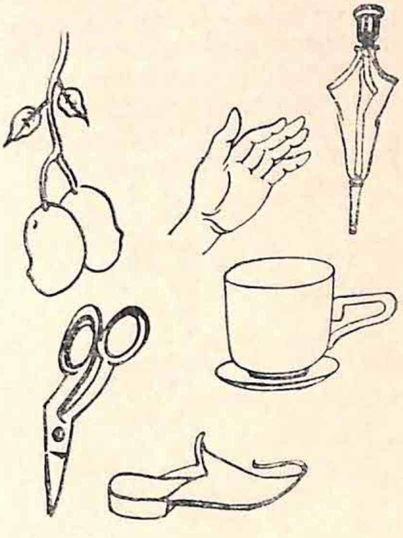


Mark the places of mistakes with cross (x) mark on each in the picture given below.



Sub-Test No. 4

(Original)

1. BIRTH ANNIVERSARY OF POET KALIDAS

Under the auspices of the Moscow World Peace Mission, a drama of Kalidas named Sakuntala was performed on Russian stage in November this year, and it was followed by criticism on his works. In the words of a famous literary critic of Russia, Sakuntala was like a cultural epic of the Gupta Age. This mission also paid tribute to the immortal genius of poet Kalidas.

2. NATURAL GAS AS A SOURCE OF ENERGY

There are many opinions as how the high power is produced from natural gas and how the gas originated inside the earth. But many think that petroleum and natural gas come out of the same source. Chemical analysis has shown that they are composed of carbon and hydrogen.

3. WONDER TO THE SHARE MARKET FOR THE PROPOSED NEW TAXATION

Due to the proposed scheme of new taxation there is a sufficient fall of price of shares in the Share markets of Calcutta and Bombay. For this, a sense of surprise has been noticed among the buyers and sellers. There has been a strong criticism against the imposition of the new taxes.

4. A NEW TYPE OF SEWING MACHINE

This year in an exhibition of Cottage Industry, a new type of sewing machine has caught the imagination of all. In this machine a piece of cloth automatically changes its place and gets itself sewn.

5. WAY OF PRESERVING SEEDS

The peasants are expressing their eagerness to introduce a method for preserving the seeds for a long time. For this purpose, the seeds are to be preserved in a protected place for avoiding high moisture. Sometimes different chemicals are to be applied.

6. AN EXHIBITION OF THE ART OF CLAY MODELLING

Recently, an exhibition of the art of clay modelling has been inaugurated in Calcutta. Many kinds of dolls and toys made of clay were exhibited there. Many artistic things from different parts of the country were also exhibited.

7. FIRST SOUND WAVE CAUGHT IN RADIO TELESCOPE OF AMERICA FROM MARS

The American Navy has declared that the Radio Telescope of America has detected for the first time a sound wave from Mars when it came to its nearest distance from Earth. This wave was caught in a Radio Telescope sixty inches in length.

8. THE TREND OF TRADE AND COMMERCE

With the change in the world situation, the conditions of trade and commerce are becoming complex. The trade and commerce of our country are still backward in comparison with those of foreign countries. Besides this, there is the fear of war. For this reason, trade and commerce cannot be carried on normally.

9. NEW MODEL OF RADIO SET

It is possible to make Radio sets at low prices with the help of crystals. As parts of the machine, crystals, coils and head phones are used. Within a distance of forty miles from the Radio Station, the programme can be heard with the help of the machine, even without electricity.

10. CULTIVATION OF VEGETABLES UNDER SAND CULTURE METHOD

Land is now not necessary for growing vegetables. People may now grow vegetables on their terrace even. In this method of cultivation a kind of chemical is mixed with sand and bits of stones to prepare the bed, and then vegetables, fruits and flowers may be grown.

11. INDIAN CLASSICAL MUSIC

The number of admirers of Classical music is gradually decreasing. Recently a music conference was held in Delhi where Suvalakshmi scored a great success in Classical music. At the closing stage of the conference a lively discussion was held on the special features of Indian music.

12. ESSAY COMPETITION IN CALCUTTA

This year in the All-India Essay Competition, the Bangabharathi has declared three special prizes for competitors aged under 20. The subject matter of the essay is 'India's role in the World Peace.'

13. NEED OF REDUCTION OF IMPORT OF THE FOREIGN GOODS

A decision has been taken in a meeting of the businessmen to reduce the import of goods from outside India. Their attention was invited to the question of proper appreciation of the goods manufactured in the country.

14. THE GREATEST ENEMY OF THE JUTE PLANT

In a research on the increase of the jute cultivation, it was revealed that a kind of insect is the greatest enemy of the jute plant. A chemical product proves very effective in destroying this kind of insect. This chemical product should be sprinkled on the leaves of the jute plant.

15. IMPORT OF A NEW MACHINE IN LOCOMOTIVE WORKSHOP

This year a new type of machine for the manufacture of boilers has been imported by the Chittaranjan Locomotive Works. The machine works with forty men and runs on electricity.

16. A NEW PHASE IN THE DRAMATIC ART

A new era has been opened today in the sphere of the film and stage. There has been a change of outlook in the world of the film and stage. To-day there is a tendency to attach more importance to contents than to dialogues and music.

17. NOBEL PRIZE IN LITERATURE

It is not proper to say that there is no deserving literature in India to win the Nobel prize. Still it may be said that they are not perhaps on the right track. Most of them do not mind sacrificing the permanent aspect of literature for the sake of satisfying the temporary demand of the society.

18. METHODS OF MEASURING ATOMIC ENERGY

A new method is believed to have been invented to ascertain the correct measurement of Atomic energy. This is as novel as it is far-reaching.

19. A NOVEL PRINTING MACHINE

A printing machine has been invented in America which records and prints the speeches simultaneously. This electricity-controlled machine is the product of higher scientific knowledge.

20. MATERIALS FOR THE CULTIVATION OF BIG-SIZED CABBAGE

A certain expert peasant has placed a sample of a big-sized cabbage in an agricultural exhibition. The cabbage weighs half a maund.

21. An Unprecedented Success of a Dancer

The famous dancer Udayasankar performed the "Dance of Nataraj" in Washington and charmed everybody. The breaking of Lord Siva's meditation was superbly portrayed.

22. Banga-Sahitya Sammelan

Messrs. Probadh Kumar Sanyal, Nihar Ranjan Roy and other prominent literary men of Bengal attended the Banga-Sahitya Sammelan, held recently at Agra. Prof. Humayun Kabir was the President of the Conference. According to him Bengali literature today stands at crossroads.

23. Decrease of the Heat of the Sun

Some scientists believe that the heat of the sun is on its decrease. To measure this heat attempts are being made to invent a scientific machine. But research is still going on for ascertaining the rate of decrease of the sun's heat.

24. Business on Small Capital

Government is now interested in offering opportunities to small traders and business men to start business on cooperative basis with small capital. It is really assuring that the attention of the Government has been drawn to this almost everywhere.

25. Cultivation of Jute by Rows

Unexpectedly good crops have been found by cultivating Jute by rows.

26. Wonderful Collection of the Art of Painting

The Artists from East and West very recently gathered in the Art Gallery of Santiniketan. The Vice-Chancellor of the University delivered a lecture describing the genius of the Indian painters like Abanindra Nath, Nandalal Bose and Jamini Roy.

27. New Research on Historical Facts

A research unit has been started to determine the time of settlement of Bengal. This research aims at throwing a new light on the period when freedom of Bengal was first established.

28. New Scientific Invention

A new era has been ushered in the field of science. The scientists in America have envolved a new method to beget creation. With the help of an intricate scientific method this creation has been made possible.

29. ESSENTIALS OF COMMERCE

Capital is not all for prosperity in commerce. Without speculation and efficiency in organization there is hardly any prospect. Thus with a small capital many men have become big business men.

30. IMPORT OF NEW MACHINE FOR WASHING

A machine to wash clothes within a very short time and with less labour has been invented. This machine is driven by electricity. In this machine clothes are put in soap water. When moved round they get cleaned automatically.

Sub-Test No. 4

(Revised)

Direction : Choose one of the news-items out of each pair.

WONDERFUL COLLECTION OF THE ART OF PAINTING

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MATERIALS FOR THE CULTIVATION OF BIG-SIZED CABBAGE

A certain expert has placed a sample of a big-sized cabbage in an agricultural exhibition. The cabbage weighs half a maund.

CULTIVATION OF JUTE BY ROWS

Unexpectedly good crops have been found by cultivating jute by rows.

A NEW TYPE OF SEWING MACHINE

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IMPORT OF A NEW MACHINE IN LOCOMOTIVE WORKSHOP

This year a new type of machine for the manufacture of boilers has been imported by the Chittaranjan Locomotive Works. The machine works with forty men and runs on electricity.

THE GREATEST ENEMY OF THE JUTE PLANT

In a research on the increase of the jute cultivation, it was revealed that a kind of insect is the greatest enemy of the jute plant. A chemical product proves very effective in destroying this kind of insects. This chemical product should be sprinkled on the leaves of the jute plant.

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There are many opinions as how the high power is produced from natural gas and how the gas originated inside the earth. But many think that petroleum and natural gas come out of the same source. Chemical analysis has shown that they are composed of carbon and hydrogen.

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Some scientists believe that the heat of the sun is on its decrease. To measure this heat attempts are being made to invent a scientific machine. But research is still going on for ascertaining the rate of decrease of the sun's heat.

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WAY OF PRESERVING SEEDS

The peasants are expressing their eagerness to introduce a method for preserving the seeds for a long time. For this purpose, the seeds are to be preserved in a protected place for avoiding high moisture. Sometimes different chemicals are to be applied.

NEW SCIENTIFIC INVENTION

A new era has been ushered in the field of science. The scientists in America have evolved a new method to beget creation. With the help of an intricate scientific method this creation has been made possible.

NEW RESEARCH ON HISTORICAL FACTS

A research unit has been started to determine the time of settlement of Bengal. This research aims at throwing a new light on the period when freedom of Bengal was first established.

NEED OF REDUCTION OF IMPORT OF THE FOREIGN GOODS

A decision has been taken in a meeting of the businessmen to reduce the import of goods from outside India. Their attention was invited to the question of proper appreciation of the goods manufactured in the country.

CULTIVATION OF JUTE BY ROWS

Unexpectedly good crops have been found by cultivating jute by rows.

WONDER TO THE SHARE MARKET FOR THE PROPOSED NEW TAXATION

Due to the proposed scheme of new taxation there is a sufficient fall of price of shares in the share markets of Calcutta and Bombay. For this, a sense of surprise has been noticed in the criticism against the imposition of the new taxes.

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WONDERFUL COLLECTION OF PAINTINGS

The Artists from East and West very recently gathered in the Art Gallery of Santiniketan. The Vice-Chancellor of the University delivered a lecture describing the genius of the Indian painters like Abanindra Nath, Nandlal Bose and Jamini Roy.

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A new era has been opened today in the sphere of the film and stage. There has been a change of outlook in the world of the film and stage. To day there is a tendency to attach more importance to contents than to dialogues and music.

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The famous dancer Udayasankar performed the "Dance of Nataraj" in Washington and charmed everybody. The breaking of Lord Siva's meditation was superbly portrayed.

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It is possible to make Radio sets at low prices with the help of crystals. As parts of the machine, crystals, coils and head phones are used. Within a distance of forty miles from the Radio Station, the programme can be heard with the help of this machine, even without electricity.

AN EXHIBITION OF THE ART OF CLAY MODELLING

Recently, an exhibition of the art of clay modelling has been inaugurated in Calcutta. Many kinds of dolls and toys made of clay were exhibited there. Many artistic things from different parts of the country were also exhibited.

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Essay Competition in Calcutta

This year in the All-India Essay Competition, the Banga-bharathi has declared three special prizes for competitors aged under 20. The subject matter of the essay is 'India's role in the World Peace'.

First sound wave caught in Radio Telescope of America from Mars

The American Navy has declared that the Radio Telescope of America has detected for the first time a sound wave from Mars when it came to its nearest distance from Earth. This wave was caught in a Radio Telescope sixty inches in length.

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A machine to wash clothes within a very short time and with less labour has been invented. This machine is driven by electricity. In this machine clothes are put in with soap water. When moved round they get cleaned automatically.

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A NEW TYPE OF SEWING MACHINE

This year in an exhibition of cottage industry, a new type of sewing machine has caught the imagination of all. In this machine a piece of cloth automatically changes its place and gets itself sewn.

ESSENTIALS OF COMMERCE

Capital is not all for prosperity in commerce. Without speculation and efficiency in organization there is hardly any prospect. Thus with a small capital many men have become big business men.

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PERSISTENCE TEST

Sub-Test 1

Directions: Answer honestly and sincerely. There are no right or wrong, good or bad answers, for each person's nature is different. Indicate your answer by a pencil mark. Do not spend much time on a question but try to answer each from actual experience in about ten seconds. If you are very doubtful about yourself on a particular question underline the 'do' (i.e. doubtful).

1. Do you like a job which requires a long time for its completion?	Yes	between	No
2. Are you usually so wrapped up in your work that you do not notice what is going on around?	Yes	do	No
3. Have you gone on playing any game till you have become good at it?	Yes	do	No
4. Do your failures tend to spur you to new efforts?	Yes	do	No
5. Do you feel unhappy if you are to leave a job unfinished?	Yes	do	No
6. Anil does not spend much time and energy on a job. If he cannot easily do it quickly, he changes to an easier one? Do you like him?	Yes	do	No
7. Do you generally find great difficulty in going on with a long job to its completion?	Yes	do	No
8. Arun knows his ideas are good. He sticks to them even if other people say he is wrong. Are you like him?	Yes	do	No
9. Do you think that you can stick to a dull and uninteresting job?	Yes	do	No
10. Do your friends, teachers or parents think of you or sometimes describe you as steady and persevering?	Yes	do	No
11. Do you usually go back to a piece of work which you could not finish for any reason?	Yes	do	No
12. Do you often put away something already started and forget about it when something new comes along?	Yes	do	No
13. Do you feel unhappy if you are to finish a job when it takes few years?	Yes	do	No
14. Do you try to deal with the difficulties with a strong determination as they arise?	Yes	do	No

15. Do you stick to a dull job without inspiration or encouragement from others?	Yes	do	No
16. Do you often change your mind or attitude?	Yes	do	No
17. Do you take another work if the started one is left unfinished ?	Yes	do	No
18. Do you take a lot of work together or finish it one by one?	Yes	do	No

Sub-Test 2 (for Assessment of Persistence)

Hints: The story that follows is an interesting one. Four characters are prominent in different parts of the story. Underline the character which tallies with yours. To be more clear read a particular portion, decide whom you like to follow and underline the name of the same.

1. Four friends Ajit, Bikash, Sunil and Monish decided to have a trip to Deoghar on bicycle. They set out at dawn. Ajit felt tired near Bandel. He said "We need not go further today. Let us witness the matinee show. It may be resumed tomorrow". Bikash opposed the idea and wanted to proceed further. He said "We are to be there to-morrow. So we must cover more today".

Whom do you follow? Ajit? Bikash?

2. At last they decided to go further and after taking rest for sometime all started quite reluctantly. Covering a pretty long distance there happened to be an accident. A bullock cart collided with the bicycle of Sunil. It was also damaged. What was the way out? Sunil became restless. He started repairing the cycle with a number of small tools from his cycle bag. But after a while he became fed up with the job. Then Monish started to repair it with rapt attention. He tried heart and soul to repair the damaged bicycle.

Whom would you follow? Sunil? Monish?

3. After attempts he brought the cycle to a running condition and the journey was resumed. Then evening was fast approaching but all were actually worn out. Still one hour's way was before them. Ajit said "Let us pass the night here. The way is beset with troubles and the rest may be covered by trains". But Sunil disagreed with him and said, "As we have set out with a definite programme, anyhow, we must proceed slowly by bicycle". However, he declined to go any longer that day.

Whom would you follow ? Ajit ? Sunil ?

4. But that decision did not hold good. At last by the instigation of Bikash it was decided to go upto Burdwan on that night. Monish was encouraged and began to proceed. But Ajit expressed sheer unwillingness and at last decided to go back.

Whom would you follow ? Monish ? Ajit ?

5. Next morning they came across Durgapur. Nearing the town, Sunil said that he would not go to Deoghar and would return home by train X. Next he thought that it

would be better not to go to Durgapur. He decided to go to the station and return home after refreshment. Bikash vehemently opposed this and felt extremely uneasy so long Deoghar is not reached.

Whom would you follow? Sunil? Bikash?

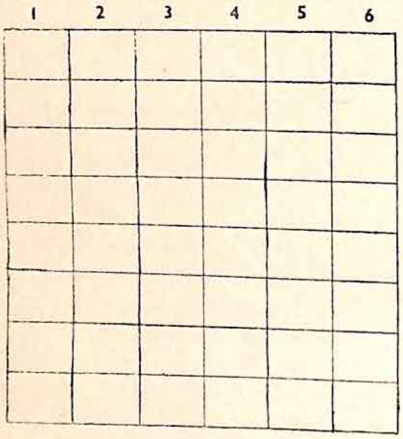
6. At last after the whole day's toil they reached Deoghar. But where they would put up? For this, they had to suffer a lot of troubles. It was decided to go to the top of the hill with bicycles? Bikash said, "Let us give up the idea of getting to the top of the hill and go back to town. Monish decided to go to the top of the hill. Taking rest for several times on his way he succeeded in reaching the hill top.

Whom would you follow? Monish? Bikash?

SITUATION-TEST (Sub Test 3.) for Assessment of Persistence.

Direction : Attempt at least one of the following activities according to direction and carry on for the whole period :

1. Dot with the pencil or prick with the pin according to the number of the rooms in the diagrams. Give dot once in room No. 1 with pencil and prick twice in room No. 2, and so on.



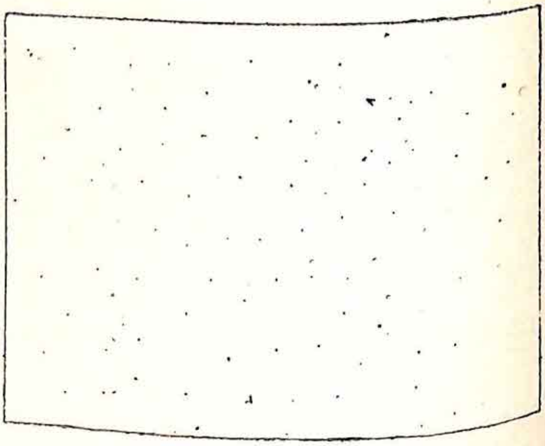
2. Cross the Vowels in the following :—

And why in heaven's name is the modern dinner jacket and its softer linen regarded as a nuisance? This baffles me. Men who are bound for the theatre will arrive home from work, bathe, shave, change their shirts and get into a day suit similar to the one they have been wearing earlier. It is every bit as easy to slip on a dinner jacket, and a great deal more "smart" and complimentary to the lady you are going to escort.

3. Write out the numbers up to any length, put circles around the even numbers and squares around the odd numbers.

$\boxed{1}$ ② $\boxed{3}$ ④ $\boxed{5}$

4. Draw as many pictures as possible by joining the dots given below :



Appendix III

SPECIMEN OF A CUMULATIVE RECORD CARD

Cumulative Record of..of

..................School, Place..................P.O................Dist..............

General Information :

Sex : Religion :

Birth Date : Birth Place :

Parent's or Guardian's Address :

ENVIRONMENTAL DATA

	Father	*Mother*	*Guardian*
Name :			
Education :			
Occupation :			
Living or Dead :			
Relationship of the Guardian :			
Type of Community in which the Pupil has lived before joining the school (village, town, city) :			
Cò-operation of the parents & Sympathy available :			

EDUCATIONAL INSTITUTIONS ATTENDED

S.No.	*Name of Institution*	*Place*	*Joined*		*Left*		*Reasons for leaving*	*Initials of Headmaster*
			Date	*Std*	*date*	*Std*		

Mental Data :

Intelligence :

Other Specific abilities :

ACHIEVEMENT DATA: (From class VI to class VIII)

Name of the pupil..

	Year Std				Year Std				Year Std			
Subject	Marks Obtained 1	Out of 2	Highest Marks 3	Average Marks 4	Marks Obtained 1	Out of 2	Highest Marks 3	Average Marks 4	Marks Obtained 1	Out of 2	Highest Marks 3	Average Marks 4
HUMANITIES												
1. Mother tongue												
2. English												
3. Sanskrit												
4. Mathematics												
5. Gen. Science												
6. History												
7. Geography												
8. Drawing												
9. Physical Education												
10. Any other Subject												
B. a. Pass b. Fail-but promoted c. Fail-detained												
C. Rank in the class	*Out of*				*Out of*				*Out of*			
D. Days present	*Out of*				*Out of*				*Out of*			
E. Free studentship if any												
F. Merit Scholarship if any												
G. Class teacher's remarks												

Emotional Data :

	A	*B*	*C*	*D*	*E*	*Remarks*
1. Persistence						
2. Confidence						
3. Fluency						
4. Initiative						
5. Industry						
6. Sociability						
7. Resourcefulness						

LEADERSHIP

Interest in:

1. Humanities
2. Science
3. Commerce
4. Technical
5. Art
6. Agriculture

HEALTH CONDITION

Physical handicaps

General Health

Major diseases suffered from

Social Data:

CO-CURRICULAR ACTIVITIES

1. Athletics
2. Games and sports
3. Dramatics
4. Music
5. Dance
6. Drawing
7. Painting
8. Literary activities
9. Excursions and tours
10. Hobbies

Other Data:

Outstanding skill or abilities shown by the pupil:

Course recommended for:

Signature of the teacher Counsellor

Signature of the Head of the Institution

GUIDANCE SCHEDULE

SECTION I: General Data:

Name of the Pupil..................................School..................................Class........Sec.........Roll........
Date of Birth..................................Year.........Month.........Day..................................
Father's Name..................................Guardian's Name..................................Relationship...............
Address...

SECTION : II : Distribution of choice or desires, likes, interests, co-curricular activities, leisure-time activities, or hobbies, teachers, estimates, etc.

Pupil's Point of view.	*Guardian's Point of view.*	*From School Record.*
P1 : Choice.	G1 : Choice.	S1 : Co-curricular activities.
P2 : Interest (Vocational).	G2 : Suggested Occupation.	S2 : Interest (Spl.).
P3 : Liking for subjects.	G3 : Suggested interests.	S3 : Teachers' Suggestions for curricular choice.
P4 : Co-curricular activities.		
P5 : Leisure-time activities or hobbies.		

HUMANITIES	SCIENCE	TECHNICAL	COMMERCE	AGRICULTURE	FINE ARTS	HOME SCIENCE

SECTION IV—TEST RECORD (IV)

HUMANITIES	SCIENCE	TECHNICAL	COMMERCE	AGRICULTURE	FINE ARTS	HOME SCIENCE
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SECTION III—ACHIEVEMENT RECORD

HUMANITIES	SCIENCE	TECHNICAL	COMMERCE	AGRICULTURE	FINE ARTS	HOME SCIENCE

SECTION V : Significant traits of the pupils' personality—
(As seen by the teacher) Ambitious/Hardworking/responsible/persevering.
(As seen by the guardian) Ambitious/Hardworking/responsible/persevering.

SECTION VI : Interview-findings of special note :

SECTION VII : Course recommended..

SECTION VIII : Remarks, if any......... ....

THE PERSONALITY INVENTORY

Date............

Name..Age..............Sex..................

Address...

Name of school
or business firm..........................School grade
or occupation..............................

The questions on this blank are intended to indicate your interests and attitudes. It is not an intelligence test, nor are there any right or wrong answers.

In front of each question you will find: "Yes No ?"

If your answer is "Yes," draw a circle around the "Yes." If your answer is "No," draw a circle around the "No." If you are entirely unable to answer either "Yes" or "No" to the question then draw a circle around the question mark.

---

1. Yes No ? Does it make you uncomfortable to be "different" or unconventional?
2. Yes No ? Do you day-dream frequently?
3. Yes No ? Do you usually work things out for yourself rather than get someone to show you?
4. Yes No ? Have you ever crossed the street to avoid meeting some person?
5. Yes No ? Can you stand criticism without feeling hurt?
6. Yes No ? Do you ever give money to beggars?
7. Yes No ? Do you prefer to associate with people who are younger than yourself?
8. Yes No ? Do you often feel just miserable?
9. Yes No ? Do you dislike finding your way about in strange places?
10. Yes No ? Are you easily discouraged when the opinions of others differ from your own?
11. Yes No ? Do you try to get your own way even if you have to fight for it?
12. Yes No ? Do you blush very often?
13. Yes No ? Do athletics interest you more than intellectual affairs?
14. Yes No ? Do you consider yourself a rather nervous person?
15. Yes No ? Do you usually object when a person steps in front of you in a line of people?
16. Yes No ? Have you ever tried to argue or bluff your way past a guard or doorman?
17. Yes No ? Are you much affected by the praise or blame of many people?
18. Yes No ? Are you touchy on various subjects?
19. Yes No ? Do you frequently argue over prices with tradesmen or junkmen?
20. Yes No ? Do you feel self-conscious in the presence of superiors in the academic or business world?
21. Yes No ? Do ideas often run through your head so that you cannot sleep?
22. Yes No ? Are you slow in making decisions?
23. Yes No ? Do you think you could become so absorbed in creative work that you would not notice a lack of intimate friends?
24. Yes No ? Are you troubled with shyness?
25. Yes No ? Are you inclined to study the motives of other people carefully?

26. Yes No ? Do you frequently feel grouchy?
27. Yes No ? Do your interests change rapidly?
28. Yes No ? Are you very talkative at social gatherings?
29. Yes No ? Do you ever heckle or question a public speaker?
30. Yes No ? Do you very much mind taking back articles you have purchased at stores?
31. Yes No ? Do you see more fun or humor in things when you are in a group than when alone?
32. Yes No ? Do you prefer travelling with someone who will make all the necessary arrangements to the adventure of travelling alone?
33. Yes No ? Would you rather work for yourself than carry out the program of a superior whom you respect?
34. Yes No ? Can you usually express yourself better in speech than in writing?
35. Yes No ? Would you dislike any work which might take you into isolation for a few years, such as forest ranging, etc?
36. Yes No ? Have you ever solicited funds for a cause in which you were interested?
37. Yes No ? Do you usually try to avoid dictatorial or "bossy" people?
38. Yes No ? Do you find conversation more helpful in formulating your ideas than reading?
39. Yes No ? Do you worry too long over humiliating experiences?
40. Yes No ? Have you ever organized any clubs, teams, or other groups on your own initiative?
41. Yes No ? If you see an accident do you quickly take an active part in giving aid?
42. Yes No ? Do you get stage fright?
43. Yes No ? Do you like to bear responsibilities alone?
44. Yes No ? Have books been more entertaining to you than companions?
45. Yes No ? Have you ever had spells of dizziness?
46. Yes No ? Do jeers humiliate you even when you know you are right?
47. Yes No ? Do you want someone to be with you when you receive bad news?
48. Yes No ? Does it bother you to have people watch you at work even when you do it well?
49. Yes No ? Do you often experience periods of loneliness?
50. Yes No ? Do you usually try to avoid arguments?
51. Yes No ? Are your feelings easily hurt?
52. Yes No ? Do you usually prefer to do your own planning alone rather than with others?
53. Yes No ? Do you find that telling others of your own personal good news is the greatest part of the enjoyment of it?
54. Yes No ? Do you often feel lonesome when you are with other people?
55. Yes No ? Are you thrifty and careful about making loans?
56. Yes No ? Are you careful not to say things to hurt other people's feelings?
57. Yes No ? Are you easily moved to tears?
58. Yes No ? Do you ever complain to the waiter when you are served inferior or poorly prepared food?
59. Yes No ? Do you find it difficult to speak in public?
60. Yes No ? Do you ever rewrite your letters before mailing them?
61. Yes No ? Do you usually enjoy spending an evening alone?
62. Yes No ? Do you make new friends easily?
63. Yes No ? If you are dining out do you prefer to have someone else order dinner for you?
64. Yes No ? Do you usually feel a great deal of hesitancy over borrowing an article from an acquaintance?

65. Yes No ? Are you greatly embarrassed if you have greeted a stranger whom you have mistaken for an acquaintance.
66. Yes No ? Do you find it difficult to get rid of a salesman?
67. Yes No ? Do people ever come to you for advice?
68. Yes No ? Do you usually ignore the feelings of others when accomplishing some end which is important to you?
69. Yes No ? Do you often find that you cannot make up your mind until the time for action has passed?
70. Yes No ? Do you especially like to have attention from acquaintances when you are ill?
71. Yes No ? Do you experience many pleasant or unpleasant moods?
72. Yes No ? Are you troubled with feelings of inferiority?
73. Yes No ? Does some particularly useless thought keep coming into your mind to bother you?
74. Yes No ? Do you ever upbraid a workman who fails to have your work done on time?
75. Yes No ? Are you able to play your best in a game or contest against an opponent who is greatly superior to you?
76. Yes No ? Have you frequently appeared as a lecturer or entertainer before groups of people?
77. Yes No ? Are people sometimes successful in taking advantage of you?
78. Yes No ? When you are in low spirits do you try to find someone to cheer you up?
79. Yes No ? Can you usually understand a problem better by studying it out alone than by discussing it with others?
80. Yes No ? Do you lack self-confidence?
81. Yes No ? Does admiration gratify you more than achievement?
82. Yes No ? Are you willing to take a chance alone in a situation of doubtful outcome?
83. Yes No ? Does your ambition need occasional stimulation through contact with successful people?
84. Yes No ? Do you usually avoid asking advice?
85. Yes No ? Do you consider the observance of social customs and manners an essential aspect of life?
86. Yes No ? If you are spending in the company of other people do you usually let someone else decide upon the entertainment?
87. Yes No ? Do you take the responsibility for introducing people at a party?
88. Yes No ? If you came late to a meeting would you rather stand than take a front seat?
89. Yes No ? Do you like to get many views from others before making an important decision?
90. Yes No ? Do you try to treat a domineering person the same as he treats you?
91. Yes No ? Does your mind often wander so badly that you lose track of what you are doing?
92. Yes No ? Do you ever argue a point with an older person whom you respect?
93. Yes No ? Do you have difficulty in making up your mind for yourself?
94. Yes No ? Do you ever take the lead to enliven a dull party?
95. Yes No ? Would you "have it out" with a person who spread untrue rumors about you?
96. Yes No ? At a reception or tea do you feel reluctant to meet the most important person present?

97. Yes No ? Do you find that people are more stimulating to you than anything else?

98. Yes No ? Do you prefer a play to a dance?

99. Yes No ? Do you tend to be radical in your political, religious, or social beliefs?

100. Yes No ? Do you prefer to be alone at times of emotional stress?

101. Yes No ? Do you usually prefer to work with others?

102. Yes No ? Do you usually work better when you are praised?

103. Yes No ? Do you have difficulty in starting a conversation with a stranger?

104. Yes No ? Do your feelings alternate between happiness and sadness without apparent reason?

105. Yes No ? Are you systematic in caring for your personal property?

106. Yes No ? Do you worry over possible misfortunes?

107. Yes No ? Do you usually prefer to keep your feelings to yourself.

108. Yes No ? Can you stick to a tiresome task for a long time without someone prodding or encouraging you?

109. Yes No ? Do you get as many ideas at the time of reading a book as you do from a discussion of it afterward?

110. Yes No ? Do you usually face your troubles alone without seeking help?

111. Yes No ? Have you been the recognized leader (president, captain, chairman) of a group within the last five years?

112. Yes No ? Do you prefer making hurried decisions alone?

113. Yes No ? If you were hiking with a group of people, where none of you knew the way, would you probably let someone else take the full responsibility for guiding the party?

114. Yes No ? Are you troubled with the idea that people on the street are watching you?

115. Yes No ? Are you often in a state of excitement?

116. Yes No ? Are you considered to be critical of other people?

117. Yes No ? Do you usually try to take added responsibilities on yourself?

118. Yes No ? Do you keep in the background at social functions?

119. Yes No ? Do you greatly dislike being told how you should do things?

120. Yes No ? Do you feel that marriage is essential to your present or future happiness?

121. Yes No ? Do you like to be with people a great deal?

122. Yes No ? Can you be optimistic when others about you are greatly depressed?

123. Yes No ? Does discipline make you discontented?

124. Yes No ? Are you usually considered to be indifferent to the opposite sex?

125. Yes No ? Would you feel very self-conscious if you had to volunteer an idea to start a discussion among a group of people?

SAMPLES OF OBJECTIVE TESTS

Geography :

1. Some of the following statements are true and some are false.

If you think the statement is true put *yes* or *true* and if you think false put *no* or *false*.

- (a) Scotland is to the north of England.
- (b) Sahara is the name of a mountain.
- (c) Calcutta is a capital of India.

2. Fill up the gaps :—
- (a) The capital of China is................ .
- (b) The river Ganges flows in................ .
- (c) ....grows in abundance in Java.

3. Put tick mark against right answer.
- (a) Jakarta is a (i) hill, (ii) lake, (iii) gulf, (iv) capital city.
- (b) Santacruz is famous as (i) airport, (ii) health resort, (iii) island, (iv) power station.

4. There are names of different mineral products; on the left hand side and on the right hand side the names of the places where they are grown have been given at random. Mark each name of the products with the corresponding number of the places.

Mica — Assam (1)
Petroleum — Mysore (2)
Gold — Bihar (3)

DIRECTIONS FOR TEACHER'S RATINGS OF PERSISTENCE AND INTEREST

1. Please read the whole scale before rating any item.

2. In rating each item disregard your ratings for that child on any other item.

3. Firstly, please try to rate the entire group of children on persistence, keeping in mind that persistence is a general quality of continually trying to accomplish a task in spite of difficulties or clinging to a purpose in the face of oppositions.

4. Try to base your ratings on observations taken over a period of three weeks from now, in the class-room, during games or outside school activities. Any observations supporting your ratings might be recorded on a separate sheet.

5. The following scale should, however, be taken into consideration before starting the work.

6. Please allow a minimum gap of two days in between the two ratings. It is a five point scale in which you are requested to indicate your assessments. In this connection it is worth noting that there may be a general tendency to place your remarks in the middle of the scale and none towards the higher end. This can be avoided by observing the following scheme :

E	*D*	*C*	*B*	*A*
5%	25%	40%	25%	5%

E Very low or poor, i.e. loses interest or gives up an activity as soon as he meets with the slightest difficulty, never takes any job with a view to sticking to it.

D Low, i.e. gives up an activity soon after coming up against one or two stumbling blocks, or easily changes to another after feeling slightly bored.

C Average, i.e. will strive to overcome difficulties, if the labor involved is not too overwhelming or will go on doing one job if he is not too bored.

B High, i.e. will strive to reach the goal even though the time involved may be fairly considerable.

A Very High, i.e. will not give up until the goal is reached or totally exhausted, no matter how much time and energy is involved.

Keeping in mind the procedure outlined in the assessment of persistence, and avoiding at all costs the consideration of any other quality, attainment or behaviour, assess as accurately as possible the persistence of each child.

Similarly, for the rating of the interest by the teachers, the different types of interest as classified in the present investigation are described as follows:

(*a*) Academic interest—one likes to read and write, literary jobs, writing essays, editing history, solving problems of mathematics, surveying a place or a society and works of similar types are included in this area.

(*b*) Scientific interest—one likes to discover new facts, to observe and analyse things for a systematic study.

(*c*) Technical interest—one likes to work with machines and tools to handle small parts of mechanical things like watch, torch-light, camera, etc. to try for devising something out of the spare parts, etc.

(*d*) Commercial interest—one shows preference for keeping accounts, making small bargains, observing price index and showing definite inclination towards business or such projects.

(*e*) Artistic interest—one likes to do creative work including painting, decorating, making attractive designs, writing poems, participating in dramatic performances, etc.

(*f*) Agricultural interest—one likes to do productive work with the soil including growing vegetables, gardening, etc. This comprises one's tendency to some experimental work on fertilization, manuring and cultivation.

Bibliography

Adams, J., *Everyman's Psychology,* University of London Press, London, 1929.

Adams, J., *The Herbartian Psychology Applied in Education,* D.O. Health, London, 1915.

Alexander, W. P., "Symposium on the selection of pupils for different types of secondary schools," *British Journal of Educational Psychology,* 17, 1947, pp. 123-30.

Allport, G. W., *Personality : A Psychological Interpretation,* Holt, New York, 1937.

Allport, G. W., Attitudes, in, A Handbook of Social Psychology. Edited by Murchison, Clark University Press, 1935.

Allport, G. W., and F. W., "A Test for Ascendence—Submission", *Journal of Abnormal and Social Psychology,* Vol. XXIII, 1928.

Allport, G. W. and Vernon, P. E., *Studies in Expressive Movement,* New York, Macmillan, 1952.

Alterder, L., "Value of Intelligence, Personality and Vocational Interest Tests in a Guidance Programme", *Journal of Educational Psychology,* 1940.

Anastaasi, A., "The Influence of Practice upon Test-Reliability", *Journal of Educational Psychology.*

Angyal, A., *Foundations for a Science of Personality,* Oxford University Press, New York, 1941.

Bhattacharya, S., A Study in the Assessment of Interest and Persistence for the Purposes of guidance—Doctoral Thesis (Unpublished).

Bell, J. E., Projective Techniques, Longmans, Green, New York, 1948.

Bernreuter, R. G., "The Measurement of Self-sufficiency", *Journal of Abnormal Psychology,* Vol. 28, p. 291, 1933-34.

Buros, O. K., *The Nineteen Forty Mental Measurement Year Book,* Highland Park, N.J. 1941. *The Third Mental Measurement Year Book,* New Brunswick, N.J., Rutgers University Press, 1949.

Burt, C., "The Education of the Young Adolescents—The psychological implication of the Norwood Report," *British Journal of Educational Psychology,* 13, 1943.

Burt, C. L., "Personality, a symposium. The Assessment of Personality", *British Journal of Educational Psychology,* 1945, 15, pp. 107-21.

Carter, H. D., The Development of Vocational Attitudes. J. Consult. Psychol. 4, pp. 185-91; 1940.

Chronback, L. J., *Essentials of Psychological Testing,* Harper.

Chown, S. M., "The Formation of Occupational Choice among Grammar School Pupils". *Occ. Psych.* Vol. 32.

Personality Factors in the Formation of Occupational Choice. B.J. Ed : P. Vol. XXIX, Pt. I, 23.34, February, 1959.

Dale, R. P., *From School to University,* Routledge & Kegan Paul & Co., 1954.

Downey, T. E., *The Will Temperament and its Testing.*

Darely, J. G. and Hagenak, J., *Vocational Interest Measurement, Minneapolis,* 1954.

Drew, L. J., *An Investigation into the measurement of Technical ability—Occup. Psychology,* 21, pp. 34-48.

Eysenck, H. J., *Dimensions of Personality,* 1947. Kegan Paul.

Eysenck, H. J., "Student Selection by means of psychological tests—A critical survey," *British Journal of Educational Psychology,* 17, 1947, pp. 20-29.

Fernald, G. E., "An Achievement Capacity Test", *Journal of Educational Psychology,* Vol. III, 1912.

Filter, R. O., "An Experimental Study in Character Traits", *Journal of Applied Psychology,* Vol. 5, 1921.

Fitzpatrick, T. E. and Wiseman, S., An Interest Test for Use in Selection for Technical Education. B.J. Ed. P., Vol.. XXIV, Pt. II, pp. 99-106, June, 1954.

Fleming, W. G., The Kuder preference Record—Vocational as a Predictor of Post High School Educational and Occupational Choices. Toronto: Ontario College of Education, 1959.

Fryer, D., *The Measurement of Interests,* Harrap, London, 1931.

Ginzberg, E., *Occupational Choice, An Approach to General Theory. O.V.P.*, London, 1951.

Gage, N. L., "Judging interests from expressive behaviour", *Psychological Monograph,* No. 350, 1952.

George E. Hill and Richard Hole., *Educational and Psychological Measurement,* 1958.

Hartshorne, H., May and Maller., Studies in Decit. Studies in Service and Self-Control, Studies in the Organisation of Character, Macmillan, New York, 1928-30.

Hollingworth, H. L., *Vocational Psychology and Character Analysis,* New York, Appleton, 1929.

Hunt, J. Mc. V. (ED), *Personality and the Behaviour Disorder,* Ronald Press, New York, 1944.

Irle, M., *Berup's Interssen Test,* Gottingen, 1955.

Jahoda, G., Job Attitudes and Job Choice among Secondary Modern School Leavers. (*i*) *Occ. Psych.*, Vol. XXVI, No. 3, pp. 125-41, July, 1952, (*ii*) *Occ. Psych.*, Vol. XXVI, No. 4, pp. 206-25, October, 1952.

Kuder, G. F., *Preference Record: Vocational,* Chicago, 1939. *Examiner Manual for the Kuder Preference Record,* Chicago, Science Research Associates, 1949.

Lambert, C. M., *Symposium on Selection of Pupils for Different Types of Secondary Schools.* V. II, *A Survey of Ability and Interest at the Stage of Transfer.* B.J. Ed. P. Vol. XIX, Pt. II, pp. 67-82, June, 1949.

Lingwood, J., "The Vocational Information Possessed by Secondary School Girls", *Occ. Psych.,* Vol. XV, No. 4, pp. 185-99, October, 1941.

Mc.Clelland (1949), *Selection for University Education,* University of London Press.

Mc.Intosh, D. M., *Educational Guidance and the Pool of Ability,* University of London Press.

McGiffin, S. J., Factors Influencing the Choice of Careers by Boys in Two Belfast Grammar Schools, B.J. Ed. P., Vol. XXVIII, Pt. II, June, 1958.

Miller, K. M., *Manual for the Rothwell Interest Blank* (Miller Revision). Melbourne, Australian Council for Educational Research, 1958.

Murray *et al, Explorations of Personality.* Oxford University Press.

Notcutt, B., *The Psychology of Personality,* Methuen (1950).

Peel, E. A., *Assessment of Interest in Practical Topics.* B.J. Ed. P., Vol. XVIII, Pt. I, pp. 41-48, February, 1989.

Paterson, D.G., *Physique and Intellect,* Appleton Century, New York, 1930.

Reeves, J. W. and Slater, P., "Age and Intelligence in Relation to Leisure Interests", *Occ. Psych.* Vol. XXI, No. 3, pp. 111-25, July, 1947.

Rodger, A., "Vocational Guidance: A Review of Some Doubts", *Occ. Psych.* Vol. XII, No. 3, pp. 187-96, Summer, 1938.

Rubenowitz, S., "Predicting Academic Success", *Occ. Psych.* Vol. 32, No. 3, pp. 162-71, July, 1958.

Sarbin, T. R. and Berdie, R. F., "Relation of Measured Interests to the Allport-Vernon Study of Values", *Journal of Applied Psychol.* No. 24, pp. 287-96.

Staines, J. W., The Development of Childrens' Values. *British Journal of Educational Psychology,* June, 1958.

Stott, M. B., "Occupational Success", *Occ. Psych.* Vol. XIII, No. 2, pp. 126-41, April, 1939. Some Differences between Boys and Girls in Vocational Guidance. *Occ. Psych.* Vol. XIX, No. 3, pp. 121-32, July, 1945.

Strong E. K., *Vocational Interests of Men and Women* O.V.P., London, 1943. "Permanence of Interest Scores over 22 years". *Journal of Applied Psych.*, No. 35, pp. 89-91, 1951. Vocational Interests 18 years after College. Minneapolis, University of Minneapolis Press, 1955.

Stagner, R., *Psychology of Personality*, 2nd edn., McGraw-Hill, New York, 1948.

Super, D. E., *Appraising Vocational Fitness*, Harper, New York, 1949.

Super, D. E., "A Theory of Vocational Development", *American Psychologist*, Vol. 8, May, 1953.

Super, D. E. and Bachrach, P. B., *Scientific Careers and Vocational Development Theory*, Columbia University Press, New York, 1957.

Symonds, P. M.,*Diognosing Personality and Conduct*, New York, Appleton Century, 1931.

Thurstone, L. L. and Chave, E. T., *The Measurement of Attitude*, Chicago, II. University of Chicago Press, 1929.

Valentine, C. W. and Tirchie, F. M., "An Enquiry as to the reasons for choice of occupation among secondary school pupils", *Forum of Education*, No. 5, pp. 85-101, 1927.

Vernon, P. E., *Personality Tests and Assessments*, Methuen & Co. Ltd., 1953.

Vernon, P. E. and Parry, J. B., *Personnel Selection in the British Forces*, U.L.P., London, 1949.

Wechs, S. C., An Investigation of the Relation between Age and Vocational Interests as measured by the Rothwell Interest Blank, Unpublished B.A. Thesis, University of Tasmania.

Wiegersms, S., *Interesse on schoolkeuze*, Liden, 1959.

Wilson, M. D., The Vocational Preferences of Secondary Modern School Children. Pt. I. B.J. Ed. P. Vol. XXIII, Pt. II, pp.97-114, June, 1953.

Wilson, M. D., The Vocational Preferences of Secondary Modern School Children, Pt. II, B.J. Ed. P. Vol. XXIII, Pt. III. pp. 163-80, November, 1953.

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